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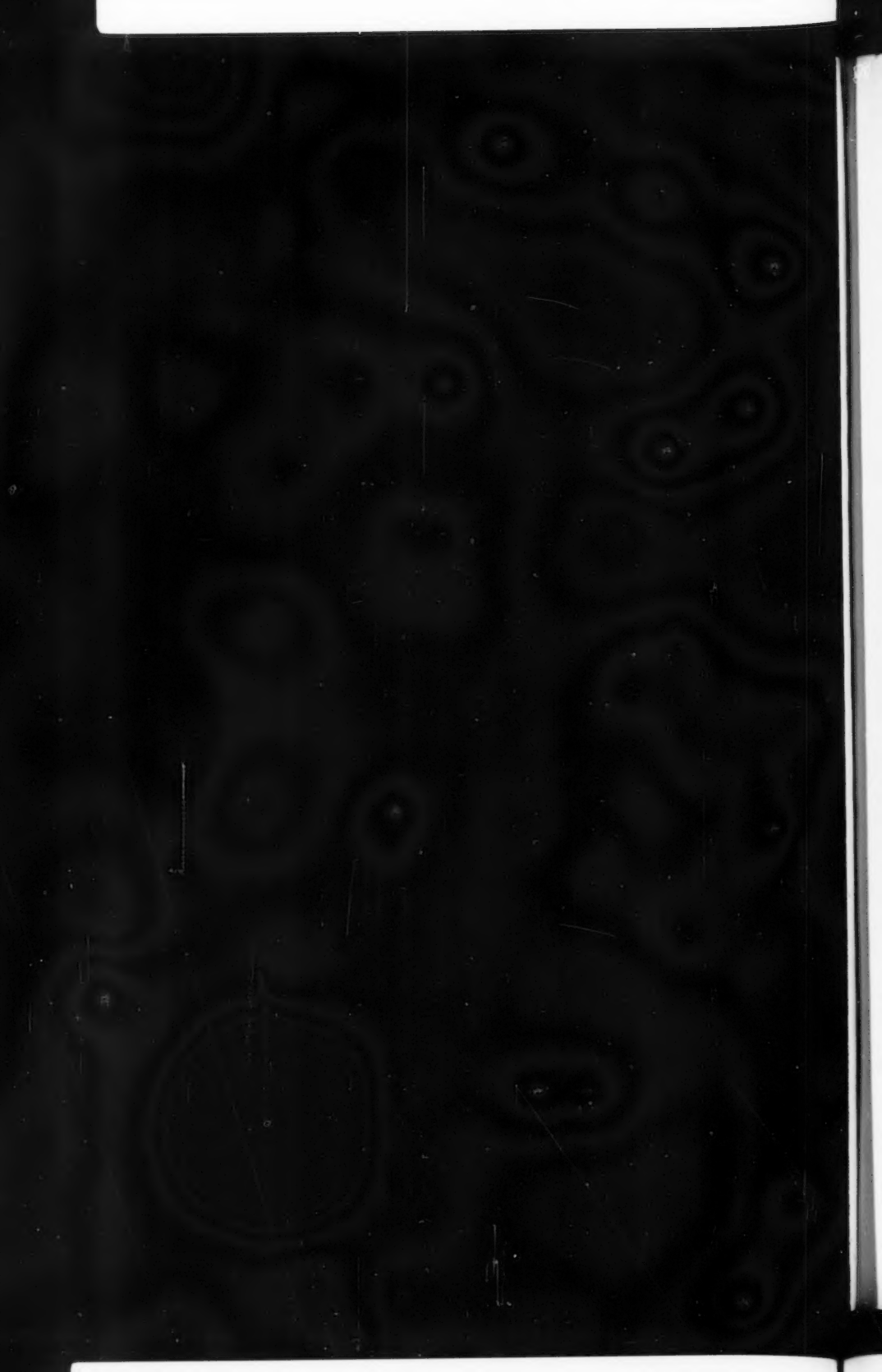

BIRD-BANDING

A JOURNAL OF ORNITHOLOGICAL INVESTIGATION

VOL. VII OCTOBER, 1936 NO. 4

RETURNS OF BANDED BIRDS: Third Paper.[1]

(SOME RECOVERIES OF WATER BIRDS FROM LATIN AMERICA)

By FREDERICK C. LINCOLN

IN preparing for punching, the great accumulation of return cards of the last two years, Miss May T. Cooke of the Biological Survey, was impressed with the constantly increasing number of recoveries that are being reported from the countries south of the Rio Grande. Accordingly, it is thought that a presentation of some of these data will be of special interest to the operators of all banding stations and other students of birds.

As was the case with the preceding papers it is not practicable to present all cases for some of the species that for several years have received much attention. For example, tens of thousands of Common Terns, *Sterna hirundo*, are banded each season and many are subsequently reported from Central American and Caribbean points. Notice of some of these has already been made in *Bird-Banding*, chiefly in papers from the O. L. Austin Ornithological Research Station. Similarly the results from the extensive banding of Black-Crowned Night Herons, *Nycticorax nycticorax hoactli*, have been largely commented upon in these pages by Dr. John B. May.[2]

While thousands of return cards have recently been punched and are now being sorted for species distribution and filing, it is impossible at the time of this writing to make an accurate statement concerning the number of returns that are on hand for the different species. Accordingly, this part in the present paper is omitted.

WHITE PELICAN. *Pelecanus erythrorhynchos*

A714413, banded at Big Quill Lake, near Dafoe, Saskatchewan, Canada, on July 6, 1932, by J. A. M. Patrick, was killed at Laguna de Yesca, 4 kilometers North of Panuco, Vera Cruz, Mexico, on January 22, 1935.

A716439, banded at Merrill, Oregon, on June 26, 1934, by H. M. Worcester, was shot at Tabasco, Mexico, on November 6, 1934.

A723339, banded at Clear Lake Wild Life Refuge, Modoc County, California, on June 26, 1934, by H. M. Worcester, was killed at Cuitzeo, Michoacan, Mexico, about January 30, 1935.

[1] First and Second papers: *Bird-Banding*, Vol. VII, pp. 38–45; 121–128.

[2] *Bull. N. E. Bird-Banding Assn.*, Vol. II, No. 2, pp. 25–28, April, 1926, and Vol. V, No. 1, pp. 7–16, January, 1929.

A723999, banded at Bird Island, Clear Lake, Modoc County, California, on June 26, 1934, by H. M. Worcester, was shot at El Carmen, Tlaxcala, Mexico, about September 25, 1934.

A727500, banded at Clear Lake Wild Life Refuge, Modoc County, California, on June 26, 1934, by H. M. Worcester, was killed at Etzatlan, Jalisco, Mexico, on February 9, 1935.

A728218, banded at Molly Island, Yellowstone Park, Wyoming, on July 23, 1933, by Roger W. Toll, was caught at Escuinapa, Sinaloa, Mexico, about November 28, 1934.

A728292, banded at Molly Island, Yellowstone Lake, Yellowstone Park, Wyoming, on June 23, 1934, by Roger W. Toll, was killed at Laguna de Zacoal, Villa Corona, 30 miles South of Guadalajara, Jalisco, Mexico, on December 30, 1934.

A728304, banded at Molly Island, Yellowstone Lake, Wyoming, on July 23, 1933, by Roger W. Toll, was killed at Caimanero, Rosario, Sinaloa, Mexico, about October 1, 1935.

A727406, banded at Clear Lake Refuge, Modoc County, California, on June 26, 1934, by H. M. Worcester, was found at Rosario, Sinaloa, Mexico, about February 10, 1935.

A727416, banded at Clear Lake Refuge, Modoc County, California, on June 26, 1934, by H. M. Worcester, was killed by natives at Caimanero, Sinaloa, Mexico, about December 5, 1934.

34-700029, banded at Lake Bowdoin, Malta, Montana, on June 17, 1934, by Vernon L. Marsh, was captured at Hacienda de Vicencio Puebla, (400 kilometers from Mexico City) Mexico, on November 2, 1934.

34-701096, banded at Molly Island, Yellowstone Lake, Yellowstone Park, Wyoming, on June 23, 1934, by Roger W. Toll, was shot by an Indian near Pachuca, Hidalgo, Mexico, about October 17, 1935.

34-701825, banded at Chase Lake, Stutsman County, North Dakota, on July 26, 1934, by Glenn L. Berner. The band was brought in by a Mexican hunter at Matamoros, Tampo, Mexico, on June 1, 1935.

34-708553, banded at Clear Lake Refuge, Modoc County, California, on July 7, 1935, by H. M. Worcester, was found at Sebampo Etchojoa, Sonora, Mexico, about April 15, 1936.

BROWN PELICAN. *Pelecanus occidentalis*

A722088, banded at Brevard Reserve, Florida, on October 22, 1932, by R. J. Longstreet, was shot at Stirrup Cay, Berry Island, Bahamas, on December 21, 1933.

A722089, banded at Brevard Reserve, Florida, on October 22, 1932, by R. J. Longstreet, was shot at Cabañas Harbor, Pinar del Rio, Cuba, on June 30, 1933.

A729080, banded at Brevard Reserve, Florida, on September 20, 1933, by R. J. Longstreet, was shot at Guauraba River, near Trinidad, Cuba, on May 19, 1934.

Five other Brown Pelicans banded at this same time and place also were recovered in Cuba.

A729381, banded at Brevard Reserve, Florida, on October 28, 1933, by R. J. Longstreet, was captured near Isabela de Sagua, Rio de Sagua la Grande, Cuba, about February 11, 1934.

A729686, banded at Brevard Reserve (Mosquito Lagoon), Florida, on October 28, 1933, by Joseph C. Howell, was shot at Eight Mile Rock, Grand Bahama, Bahamas, on February 22, 1935.

A729690, banded at Brevard Reserve, Florida, on October 28, 1933, by Joseph C. Howell, was found sick and died at Rio Canimas, Matanzas, Cuba, on March 23, 1934.

A729708, banded at Brevard Reserve, Florida, on October 28, 1933, by Joseph C. Howell, was shot at Stirrup's Cay, Bury Island, Bahamas, on March 23, 1934.

A729856, banded at Brevard Reserve, Florida, on September 30, 1934, by Joseph C. Howell, was found dead at Cienfuegos, Cuba, on September 2, 1935. Two others banded at the same time and place, also reported from Cuba.

34-702712, banded at Pelican Island, Mosquito Lagoon, Florida, on November 4, 1934, by Edward M. Davis, was captured at Vasquez, Cuba, on February 8, 1935.

34-702816, banded at Pelican Island, Mosquito Lagoon, Florida, on November 4, 1934, by Edward M. Davis, was captured at Progreso, Yucatan, Mexico, on September 4, 1935.

34-702911, banded at Pelican Island, Mosquito Lagoon, Florida, on November 12, 1934, by Edward M. Davis, was captured and released at Matanzas, Cuba, on January 10, 1935.

34-703040, banded at Brevard Reserve, Florida, on October 20, 1934, by R. J. Longstreet, was caught 15 miles off Manzanillo, Cayo Medano, Cuba, on February 5, 1936.

34-703466, banded at Pelican Island, Mosquito Lagoon, Florida, on November 18, 1934, by Edward M. Davis, was killed at Bay of Puerto Padre, Oriente, Cuba, about April 1, 1935.

36-800196, banded at Pelican Island, Mosquito Lagoon, Florida, on September 30, 1935, by Edward M. Davis, was found dead at La Coloma, Pinar del Rio, Cuba, about December 15, 1935.

36-800315, banded at Pelican Island, Mosquito Lagoon, Florida, on October 20, 1935, by Edward M. Davis, was captured and released at Nuevitas, Cuba, on February 25, 1936.
Fourteen others, banded at this same time and place also were reported from Cuba.

GREAT BLUE HERON. *Ardea herodias*

A717307, banded at Spider Island, Door County, Wisconsin, on June 30, 1933, by William I. Lyon, was killed at Mendoza, Pinar del Rio, Cuba, about July 1, 1934.

A718671, banded at Bird Island, Clear Lake Refuge, California, on June 17, 1932, by H. M. Worcester, was found dead near Culiacán, Sinaloa, Mexico, about January 1, 1935.

C622018, banded at Woody Island, Lake Bowdoin, Malta, Montana, on June 20, 1933, by Vernon L. Marsh, was found wounded at San Pedro, Tamaulipas, Mexico, on January 18, 1935.

C622169, banded at Woody Island, Lake Bowdoin, Malta, Montana, on June 20, 1933, by Vernon L. Marsh, was shot at El Charquito, near Tula, Tamaulipas, Mexico, on April 12, 1935.

34-700136, banded at Lake Bowdoin, Malta, Montana, on June 17, 1934, by Vernon L. Marsh, was killed 12 miles South of Monclova, Coahuila, Mexico, on October 22, 1934.

34-700144, banded at Lake Bowdoin, Malta, Montana, on June 17, 1934, by Vernon L. Marsh, was shot at Orizatlan, Hidalgo, Mexico, about February 1, 1935.

34-700194, banded at Lake Bowdoin, Malta, Montana, on June 17, 1934, by Vernon L. Marsh, was wounded at Cadereyta Montes, Queretaro, Mexico, on January 13, 1935.

EGRET. *Casmerodius albus egretta*

34-661891, banded at Good Hope, Mississippi, on June 16, 1935, by Ben B. Coffey, Jr., was shot near Belize, British Honduras, on December 1, 1935.

SNOWY EGRET. *Egretta thula*

B611997, banded at Vingte'un Island, Trinity Bay, Chambers County, Texas, on May 29, 1932, by Alston Clapp, Sr., was shot at Banana River, Costa Rica, on July 8, 1933.

REDDISH EGRET. *Dichromanassa rufescens*

B624233, banded at an island in San Antonio Bay, Aransas County, Texas, on May 30, 1935, by Alston Clapp, Sr., was killed at Huatusco, Veracruz, Mexico, on October 8, 1935.

LITTLE BLUE HERON. *Florida caerulea*

A540044, banded at Heron Island, Charleston County, South Carolina, on June 11, 1932, by E. Milby Burton, was shot near St. Thomas, Jamaica, British West Indies, on October 30, 1934.

A567203, banded at Heron Island, Charleston County, South Carolina, on June 12, 1933, by E. Milby Burton, was caught at Duncan Town, Ragged Island, Bahamas, British West Indies, on October 1, 1935.

34-523162, banded at Heron Island, Charleston County, South Carolina, on June 6, 1934, by E. Milby Burton, was killed at Cumaná, Venezuela, South America, on October 21, 1934.

BLACK-CROWNED NIGHT HERON. *Nycticorax nycticorax hoactli*

326515, banded at St. Clair Flats, Michigan, on June 21, 1925, by W. B. Purdy, was shot at Agabama River, 12 miles from Trinidad, Cuba, on July 4, 1927.

B664630, banded at East Springfield, Massachusetts, on June 18, 1932, by Harry Earle Woods, was killed at Los Hermanos, Cuba, about February 15, 1935.

B699932, banded at Susquehanna River at Harrisburg, Pennsylvania, on June 7, 1933, by Dr. Harold B. Wood, was found dead at Remates, Pinar del Rio, Cuba, about March 20, 1934.

B670084, banded at Duck Creek, Brown County, Wisconsin, on July 10, 1932, by William I. Lyon, was shot at Lake Ariguanabo, near Habana, Cuba, on December 21, 1932.

PINTAIL. *Dafila acuta tzitzihoa*

599[—]6, banded at Ellinwood, Kansas, in February, 1930, by F. W. Robl, was killed at Hacienda Gogarrón, San Luis Patosi, Mexico, on December 9, 1934.

A575291, banded at Newman, California, on October 4, 1933, by Egbert R. Jones, was killed 40 miles southeast of Tepic, Nayarit, Mexico, during the Fall of 1933.

B659752, banded at Ellinwood, Kansas, on March 26, 1932, by F. W. Robl, was shot at Zacoalco, Jalisco, Mexico, on November 2, 1932.

B660745, banded at Ellinwood, Kansas, on March 5, 1933, by F. W. Robl, was killed at Cape Obregon, Sonora, Mexico, about April 25, 1935.

C607059, banded at Avery Island, Louisiana, on February 5, 1933, by E. A. McIlhenny, was shot at Laguna Japoy, Tamesi River, Tamaulipas, Mexico, on December 15, 1934.

C614894, banded at Ellinwood, Kansas, on March 25, 1933, by F. W. Robl, was shot at San José del Paso, Guanajuato, Mexico, on January 30, 1934.

C617525, banded at Ellinwood, Kansas, on April 5, 1933, by F. W. Robl, was shot at Durango, Durango, Mexico, on October 24, 1933.

34-500732, banded at Brooks, Alberta, on July 29, 1934, by Egbert R. Jones, was shot, but not killed, at Tenango del Valle, Mexico, about April 20, 1936.

34-502178, banded at Voltage, Oregon, on October 22, 1934, by George M. Benson, was shot at Municipio de Tecualan, Nayarit, Mexico, about April 1, 1935.

34-502311, banded at Voltage, Oregon, on October 23, 1934, by George M. Benson, was shot at Zamora, Michoacan, Mexico, about February 1, 1935.

34-502342, banded at Voltage, Oregon, on October 24, 1934, by George M. Benson, was killed at Santa Maria Slough, Lower California, on November 24, 1934.

34-512017, banded at Ellinwood, Kansas, on March 5, 1934, by F. W. Robl, was killed near Mazatlan, Sinaloa, Mexico, on October 10, 1934.

34-512095, banded at Ellinwood, Kansas, on March 6, 1934, by F. W. Robl, was killed at Cameron, Nuevo Leon, Mexico, about September 25, 1934.

34-512320, banded at Ellinwood, Kansas, on March 7, 1934, by F. W. Robl, was shot near Zamora, Michoacan, Mexico, on October 21, 1934.
34-512530, banded at Ellinwood, Kansas, on March 9, 1934, by F. W. Robl, was shot at Laguna de Texcoco, near Mexico City, Mexico, on January 13, 1935.
34-515257, banded at Ellinwood, Kansas, on April 11, 1934, by F. W. Robl, was shot at Laguna de Garrobas, 15 miles Southeast of Puerto Cortes, Spanish Honduras, on January 29, 1935.
34-604392, banded at Newman, California, on September 1, 1934, by Egbert R. Jones, was shot at Matamoros, Tamaulipas, Mexico, on October 7, 1934.

GREEN-WINGED TEAL. *Nettion carolinense*

101495, banded at Avery Island, Louisiana, on March 4, 1922, by E. A. McIlhenny, was shot at Sabinas River, Coahuila, Mexico, on February 2, 1930.

BLUE-WINGED TEAL. *Querquedula discors*

237861, banded at La Batture aux Loups, Marins, near L'Islet, Quebec, on September 5, 1930, by Iver S. Adams, was shot at Plantation Enmore, Georgetown, British Guiana, on October 2, 1930.
363850, banded at Kearney, Nebraska, on April 13, 1927, by A. R. Golay, was shot at Santa Marta, Colombia, South America, about October 15, 1927.
531723, banded at Waco, Texas, on March 8, 1929, by William P. Sparks, was shot at Matamoros, Tamaulipas, Mexico, about December 13, 1930.
531961, banded at Ellinwood, Kansas, on May 4, 1929, by F. W. Robl, was shot at Elia, Camagüey, Cuba, about August 19, 1930.
533401, banded at Ellinwood, Kansas, on May 5, 1929, by F. W. Robl, was killed at the Piedra Blanca Ranch, Coahuila, Mexico, about October 15, 1930.
A500212, banded at Ellinwood, Kansas, on April 10, 1930, by F. W. Robl, was killed 40 miles below Matamoros, Tamaulipas, Mexico, on September 18, 1931.
A500216, banded at Ellinwood, Kansas, on April 10, 1930, by F. W. Robl, was killed at Chuburna, Yucatan, Mexico, on February 8, 1931.
A500231, banded at Ellinwood, Kansas, on April 12, 1930, by F. W. Robl, was shot at Caroni Swamps, Trinidad, British West Indies, on March 24, 1932.
A500237, banded at Ellinwood, Kansas, on April 13, 1930, by F. W. Robl, was shot at Puerto Cortes, Spanish Honduras, in February, 1931.
A507743, banded at Ellinwood, Kansas, on April 27, 1932, by F. W. Robl, was shot at Colonia Portada Norte, Minatitlan, Mexico, during March, 1934.
A507751, banded at Ellinwood, Kansas, on April 28, 1932, by F. W. Robl, was shot at Montego-Bay, Jamaica, British West Indies, on October 1, 1935.
A510183, banded at Ellinwood, Kansas, on April 24, 1930, by F. W. Robl, was shot at Corocito, Honduras, on November 7, 1931.
A544414, banded at Munuskong State Park, Chippewa County, Michigan, on August 17, 1932, by H. D. Ruhl, was captured at Loiza, Puerto Rico, on April 11, 1935.
B620791, banded at Forest Lake, Minnesota, on July 28, 1932, by Walter P. Houle, was shot at Sisal, Yucatan, Mexico, on November 21, 1932.

CINNAMON TEAL. *Querquedula cyanoptera*

536899, banded at Modesto Properties, 15 miles west of Merced, California, on July 16, 1933, by Egbert R. Jones, was shot at Hacienda La Casita, Sonora, Mexico, on August 25, 1934.
A504407, banded 12 miles west of Merced, California, on July 4, 1930, by Egbert R. Jones, was shot at Guadalajara, Jalisco, Mexico, on September 29, 1930.
A504442, banded 15 miles west of Merced, Merced County, California, on July 10, 1930, by Egbert R. Jones, was killed at Querendaro, Michoacan, Mexico, about November 14, 1931.

A504929, banded at Voltage, Oregon, on October 8, 1930, by George M. Benson, was found at Tepic, Nayarit, Mexico, on November 5, 1930.

REDHEAD. *Nyroca americana*

455411, banded at Bear River Marshes, Utah, on June 25, 1929, by Archie Hull, was shot at Boquilla Lake, Ciudad Camargo, Chihuahua, Mexico, on November 8, 1929.

A607092, banded at Bear River Marshes, Utah, on July 20, 1929, by Archie Hull, was shot at Mazatlan, Sinaloa, Mexico, on December 13, 1929.

A607348, banded at Bear River Marshes, Utah, on July 23, 1929, by Archie Hull, was killed at Baja California, Mexico, 35 miles below the border, on January 15, 1930.

A607492, banded at Bear River Marshes, Utah, on July 24, 1929, by Archie Hull, was killed at Mazatlan, Sinaloa, Mexico, about May 6, 1930.

A646459, banded at Bear River Marshes, Utah, on July 24, 1930, by Archie Hull, was shot 14 miles north of Cananea, Sonora, Mexico, on November 9, 1930.

A646473, banded at Bear River Marshes, Utah, on July 24, 1930, by Archie Hull, was killed 20 miles east of Chihuahua, Mexico, on October 26, 1930.

A651264, banded at Bear River Marshes, Utah, on August 4, 1930, by Archie Hull, was killed at Cananea, Sonora, Mexico, on October 21, 1930.

A687079, banded at Box Elder County, Utah, on July 29, 1931, by George E. Mushbach, was shot at El Descanso, Lower California, Mexico, on August 26, 1931.

B635469, banded at Box Elder County, Utah, on August 4, 1932, by George E. Mushbach, was shot at Amealco, Queretaro, Mexico, on December 18, 1932.

B635675, banded at Box Elder County, Utah, on August 5, 1932, by George E. Mushbach, was shot at Lake Patzcuaro, Michoacan, Mexico, on February 15, 1933.

B635698, banded at Box Elder County, Utah, on August 4, 1932, by George E. Mushbach, was captured and released at Empalme, Sonora, Mexico, on March 13, 1934.

B639195, banded at Voltage, Oregon, on April 1, 1932, by George M. Benson, was shot at Tia Juana, Lower California, Mexico, on January 5, 1935.

LESSER YELLOW-LEGS. *Totanus flavipes*

34-258574, banded at North Eastham, Cape Cod, Massachusetts, on August 3, 1935, by O. L. Austin, was killed at São Paulo, Brazil, South America, in November, 1935.

CALIFORNIA GULL. *Larus californicus*[3]

544378, banded at Bittern Lake, 12 miles West of Camrose, Alberta, on June 22, 1927, by Frank L. Farley, was killed in the Valley of Yaqui River, Mexico, about June 16, 1934.

A571828, banded at Woody Island, Lake Bowdoin, Malta, Montana, on June 17, 1934, by Vernon L. Marsh, was found dead at Rio Sextin, Municipio de Inde, Durango, Mexico, on January 7, 1935.

A571947, banded at Woody Island, Lake Bowdoin, Malta, Montana, on June 17, 1934, by Vernon L. Marsh, was found at Rio Yaqui, Sonora, Mexico, about April 22, 1936.

A572002, banded at Woody Island, Lake Bowdoin, Malta, Montana, on June 17, 1934, by Vernon L. Marsh, was found at Culiacán, Sinaloa, Mexico, on December 5, 1934.

A678642, banded at Gull Island, Bittern Lake, Alberta, on June 18, 1932, by Frank L. Farley, was shot at Mexicali, Baja California, Mexico, on January 27, 1935.

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[3]There is some question of identity of these gulls as in nearly every case two or three species were nesting together. The points of recovery, however, are most probable for this species.

COMMON TERN. *Sterna hirundo*

The following represent groups of birds banded in the O. L. Austin Ornithological Station at North Eastham, Cape Cod, Massachusetts, the actual banding site being "Tern Island" in that general neighborhood:

Four, banded during the period June 24–27, 1934, were recaptured in December, 1934, and April, 1935, near Cayenne, French Guiana.

Six, banded during the period June 24–26, 1934, were recaptured on November 15, and December 9, 1934, near Cumaná, Venezuela.

Four, banded during the period June 26–July 1, 1934, were recaptured on September 15 and October 20, 1934, in the Dominican Republic.

Nine, banded during the period June 24–July 15, 1934, were recaptured on September 13 and December 28, 1934, near Puerto Rico.

478068, banded at Brant Beach, New Jersey, on July 13, 1927, by John Bartram, was found exhausted at Upper Pomeroon, British Guiana, on January 7, 1933.

674003, banded at Tern Island, Chatham, Massachusetts, on July 1, 1928, by Charles B. Floyd, was killed at Cabo Rojo, Puerto Rico, on September 7, 1934. During the period, September 7–15, 1934, thirteen Common Terns banded at Cape Cod, Massachusetts, were reported killed or captured at Cabo Rojo, Puerto Rico.

A330171, banded at Penikese Island, Massachusetts, on July 5, 1929, by L. B. Fletcher, was killed at El Guamache, Venezuela, South America, in January, 1934.

A340930, banded at Upper Sugar Loaf Island, Maine, on July 5, 1930, by Olin S. Pettingill, Jr., was found dead at Cayenne, French Guiana, on May 31, 1931.

A364220, banded at Lower Sugar Loaf Island, Maine, on July 11, 1930, by Olin S. Pettingill, was shot at Brighton Pier, Brighton Trinidad, British West Indies, in March, 1931.

A420635, banded at Lower Sugar Loaf Island, Popham, Maine, on July 11, 1930, by Alfred O. Gross, was found at Marabelle Beach, Trinidad, about May 28, 1931.

A432347, banded at Beach Haven, New Jersey, on July 2, 1931, by James Spear, Jr., was captured at Labrea, Trinidad, British West Indies, about March 3, 1932.

A432348, banded at Beach Haven, New Jersey, on July 2, 1931, by James Spear, Jr., was caught alive at Carupano, Venezuela, on September 14, 1931.

A435784, banded at Brant Beach, New Jersey, on July 15, 1934, by William B. Wright, was killed at Camuy, Puerto Rico, about September 15, 1934.

B306722, banded at Large Weepecket Island, Gosnold, Massachusetts, on June 27, 1931, by Ethel M. and Sears Crowell, was found dead at Cumaná, Venezuela, South America, on December 5, 1934.
Four others banded at the same time and place were retaken on the island of Trinidad, British West Indies and three were recaptured in Puerto Rico.

B312234, banded at Penikese Island, Massachusetts, on July 6, 1933, by Winsor M. Tyler, was shot at St. Michael, Barbados, British West Indies, on September 10, 1933.

B312306, banded at Penikese Island, Massachusetts, on July 6, 1933, by Winsor M. Tyler, was captured alive at Areeibo, Puerto Rico, about October 17, 1933.

B312787, banded at Penikese Island, Massachusetts, on July 6, 1933, by Winsor M. Tyler, was killed at Roseau, Dominica, British West Indies, about October 25, 1933.

B312820, banded at Penikese Island, Massachusetts, on July 6, 1933, by Winsor M. Tyler, was picked up by a fisherman at Labrea, Trinidad, British West Indies, on March 22, 1934.

B348371, banded at Weepecket Island, Gosnold, Massachusetts, on July 6, 1933, by Ethel M. and Sears Crowell, was killed at Fort de France, Martinique, on August 30, 1933.

B351390, banded at Tern Island, Chatham, Massachusetts, on June 23, 1933, by Dr. Oliver L. Austin, was captured alive at Port-of-Spain, Trinidad, British West Indies, on June 22, 1935.

B351476, banded at Tern Island, Chatham, Cape Cod, Massachusetts, on June 23, 1933, by Dr. Oliver L. Austin, was found dead at Massacre River, Manzanilo Bay, Dominican Republic, about September 1, 1935.

B366235, banded at Lone Tree Island, Sebawaing, Michigan, on July 13, 1932, by F. E. Ludwig, was found dead at Iriona, Honduras, on November 19, 1932.

B371450, banded at North Point, Chatham, Massachusetts, on July 9, 1932, by Dr. Oliver L. Austin, was found dead on the Island of Marajó, Para, Brazil, on January 3, 1936.

B378353, banded at Brant Beach, New Jersey, on June 25, 1933, by J. A. Gillespie, was captured alive at Port Royal, Jamaica, British West Indies, on September 2, 1933.

B395923, banded at Egg Island, Lewis Bay, Hyannis, Massachusetts, on July 13, 1933, by Dr. Oliver L. Austin, was killed at Sanchez, Dominican Republic, about December 1, 1934.

B397248, banded at Tern Island, Chatham, Massachusetts, on June 24, 1934, by Dr. Oliver L. Austin, was killed at Cubagua, Venezuela, South America, in December, 1934.

B398874, banded at Tern Island, Chatham, Massachusetts, on June 24, 1934, by Dr. Oliver L. Austin, was shot at Anchor Ranch, Turani, Berbice River, British Guiana, about March 15, 1935.

C305260, banded at Ram Island, Mattapoisett, Massachusetts, on June 27, 1934, by Ethel M. Crowell, flew aboard boat, exhausted, died in an hour, at Essequibo and Demerara River, near Demerara, British Guiana, on November 28, 1934.

C305284, banded at Ram Island, Mattapoisett, Massachusetts, on June 27, 1934, by Ethel M. Crowell, killed at Cayenne, French Guiana, about February 7, 1935.

C305529, banded at Ram Island, Mattapoisett, Massachusetts, on June 27, 1934, by Ethel M. Crowell, was shot at St. Philip, Barbados, British West Indies, in September, 1934.

C312746, banded at Brant Beach, New Jersey, on July 1, 1934, by James Spear, Jr., boarded a fisherman's canoe, exhausted, at Macuto, near La Guayra, Venezuela, on January 1, 1935.

C316881, banded at Penikese Island, Massachusetts, on July 2, 1933, by Charles B. Floyd, flew aboard ship 15 miles northeast entrance to San Juan River, Venezuela, on April 3, 1934.

C317033, banded at Penikese Island, Massachusetts, on July 2, 1933, by Charles B. Floyd, was shot at Aruba, British West Indies, on September 8, 1933.

C320401, banded at Penikese Island, Massachusetts, on July 4, 1934, by Charles B. Floyd, was caught at Arecibo, Puerto Rico, on September 4, 1934.

C330207, banded at Pelican Island, Leech Lake, Minnesota, on July 6, 1933, by Dr. H. A. Burns, was found injured at La Venta Beach, 87 miles southwest of Panama City, Canal Zone, about October 1, 1934.

34-314888, banded at Jack Island Reef, near Ephraim, Wisconsin, on July 5, 1934, by Harold C. Wilson, was killed at Lamentin, Martinque, French West Indies, on September 25, 1935.

34-324669, banded at Tern Island, Chatham, Massachusetts, on July 1, 1934, by Dr. Oliver L. Austin, was killed by a fisherman at Barcelona, Venezuela, South America, on November 11, 1934.

34-326294, banded at Egg Island, Lewis Bay, Hyannis, Massachusetts, on July 2, 1934, by Dr. Oliver L. Austin, was killed at Sanchez, Dominican Republic, about December 1, 1934.

34-335683, banded at Little Egg Harbor, New Jersey, on July 13, 1934, by Henry P. Baily, was killed at Golden Fleece, Essequibo Coast, British Guiana, about April 5, 1936.

34-337361, banded at Lower Wedgeport, Nova Scotia, on June 30, 1934, by Israel J. Pothier, was found dead at Chavon River near La Romana, Dominican Republic, about October 10, 1934.

34-346504, banded at Tern Island, Chatham, Massachusetts, on June 8, 1935, by Dr. Oliver L. Austin, was found dead at Belem, Brazil, South America, on March 3, 1936.

34-374589, banded at Yarmouth County, Nova Scotia, on July 13, 1935, by Israel J. Pothier, was captured at Port-of-Spain, Trinidad, British West Indies, on April 6, 1936.

35-302133, banded at Billingsgate Island, Massachusetts, on June 25, 1935, by Dr. Oliver L. Austin, was killed at Golden Fleece, Essequibo Coast, British Guiana, about April 5, 1936.

35-306826, banded at Tern Island, Chatham, Massachusetts, on June 29, 1935, by Dr. Oliver L. Austin, was captured and released at Port-of-Spain, Trinidad, British West Indies, on April 23, 1936.

35-308333, banded at Tern Island, Chatham, Massachusetts, on July 1, 1935, by Dr. Oliver L. Austin, was captured and released at Port-of-Spain, Trinidad, British West Indies, on April 23, 1936.

ROSEATE TERN. *Sterna dougalli*

A332394, banded at Penikese Island, Massachusetts, on July 4, 1933, by L. B. Fletcher, was found dead at Guayanilla, Puerto Rico, on September 9, 1933.

B304623, banded at Tern Island, Chatham, Massachusetts, on June 22, 1932, by O. L. Austin, Jr., was found dead 25 miles west of San Juan, Porto Rico, September 13, 1932.

34-304635, banded at Weepecket Island, Gosnold, Massachusetts, on July 6, 1934, by Ethel M. and Sears Crowell; captured alive at "Corozo," Cabo Rojo, Puerto Rico, about September 10, 1934.

B321889, banded at Tern Island, Chatham, Massachusetts, on July 2, 1931, by Dr. Oliver L. Austin, captured alive at "Corozo," Cabo Rojo, Puerto Rico, about September 10, 1934.

Three, banded during the period of June 24–July 1, 1934, were recaptured at the same time and place as the above.

B321899, banded at Tern Island, Chatham, Massachusetts, on July 2, 1931, by Dr. Oliver L. Austin, was killed at Boca Chica, Santo Domingo, Dominican Republic, on August 17, 1933.

B397832, banded at Tern Island, Chatham, Massachusetts, on June 24, 1934, by Dr. Oliver L. Austin, was found sick at Buxton, east coast of Demerara, British Guiana, on June 3, 1935.

LEAST TERN. *Sterna antillarum*

35-117667, banded at Davis Causeway, Tampa Bay, Florida, on June 1, 1935, by George D. Robinson, was captured at Greenfield, British Guiana, on January 27, 1936.

ROYAL TERN. *Thalasseus maximus*

A508887, banded at Egg Bank, Beaufort County, South Carolina, on July 10, 1930, by E. Milby Burton, was killed at Santa Cruz del Sur, Cuba, about March 12, 1934.

A525593, banded at Bird Island, Galveston County, Texas, on June 19, 1932, by Alston Clapp, Sr., was killed at La Barra de la Coyuca, Guerrero, Mexico, on September 22, 1933.

A531082, banded at Cape Romain, Charleston County, South Carolina, on July 18, 1931, by E. Milby Burton, was found exhausted and died at latitude 28.23, longitude 90.26, west part of the Gulf of Mexico, on board ship, on June 16, 1934.

A531430, banded at Cape Romain, Charleston County, South Carolina, on July 18, 1931, by E. Milby Burton, was killed at Caibarién, Cuba, about December 1, 1933.

A542459, banded at Cape Romain, Charleston County, South Carolina, on July 11, 1933, by E. Milby Burton, was caught in a fish net at Montego Bay, Jamaica, British West Indies, on June 22, 1934.

A542493, banded at Cape Romain, Charleston County, South Carolina, on July 11, 1933, by E. Milby Burton, was found dead at San Nicolas, Provincia de la Habana, Cuba, about August 20, 1935.

A578141, banded at Cape Romain, Charleston County, South Carolina, on July 11, 1933, by E. Milby Burton, was killed at Turbo, Gulf of Urabá, Department of Antioquia, Colombia, South America, on October 3, 1934.

A578271, banded at Cape Romain, Charleston County, South Carolina, on July 11, 1933, by E. Milby Burton, was shot at Aux Cayes, Haiti, on April 24, 1935.

34-524703, banded at Charleston County, South Carolina, on July 24, 1935, by E. Milby Burton, was found dead at Corozal, British Honduras, on April 1, 1936.

34-524859, banded at De Veaux's Bank, Charleston County, South Carolina, on July 24, 1935, by E. Milby Burton, was found dead at Rio Yaque del Norte, near Monte Cristi, Dominican Republic, on April 19, 1936.

CASPIAN TERN. *Hydroprogne caspia imperator*

A565352, banded at Gull Island, Georgian Bay, 33 miles east of Little Current, Ontario, on July 9, 1933, by William I. Lyon, was shot at Barranquilla, Colombia, South America, on May 31, 1934.

B608770, banded at Shoe Island, Michigan, on July 18, 1931, by William I. Lyon, was shot at Belize, British Honduras, Central America, on November 28, 1935.

34-415908, banded at Shoe Island, Lake Michigan, on July 2, 1935, by F. E. Ludwig, was wounded at Barranquilla, Colombia, South America, about April 1, 1936.

The Biological Survey will be glad to have opinions from banders and other students of birds as to the usefulness of this series of papers. Suggestions for improvements also will be welcomed, as well as recommendations for the treatment of any particular groups in which there is special interest.

Biological Survey, Washington, D. C.

BANDING BARN SWALLOWS

(*Hirundo Erythrogaster*)

A REPORT OF OPERATIONS AT SHIRLEY, MASSACHUSETTS, 1932–36

By E. M. and W. M. DAVIS

EACH summer since 1932 the authors have tried to band as many Barn Swallows as possible. Starting on July 1, 1932, we banded 157 birds that season; in 1933, 417 new birds were banded and there were 17 returns; in 1934, we banded 779 new birds and had 38 returns; in 1935 we added 614 new birds and had 37 returns. Of the birds banded in 1932 in our barn, 16 were returns in 1933; 5 in 1934; 3 in 1935; 3 in 1936. From birds banded in 1933 there were 14 returns in 1934; 4 in 1935; 3 in 1936. This shows a great drop in returns after the first year, with the subsequent returns nearly the same from year to year. However, it would be well to have figures for several more years before drawing conclusions.

In getting these results we have used various methods to secure our birds. Naturally as many nestlings as possible are banded, and in doing this we have found a twenty-two foot extension ladder with a usable length of from eleven to eighteen feet of the greatest assistance. It allows us to reach nests at varying distances above the floor and scaffolds with a minimum of difficulty, and is light enough for one person to handle easily when necessary. On the accompanying map the barns which we have visited are indicated. It is a constant source of surprise how few "good" swallow barns are to be found; even as many as five nests in one barn are not at all common in this neighborhood; our very best barn (No. 17) contains eighteen occupied nests this year (1936).

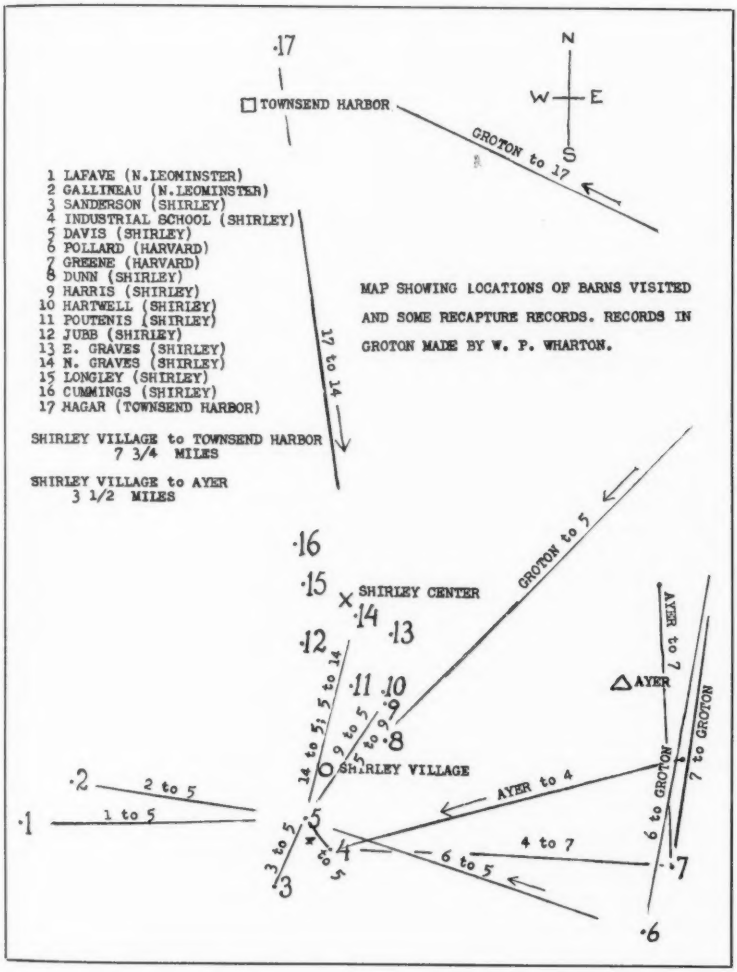
We have banded Swallows in seventeen different barns. Twelve of these are in Shirley, two in North Leominster, one in Townsend Harbor, and two in Harvard.

In addition to nestlings, we have made every effort to catch as many juveniles and adults as possible, for it was evident from the beginning that unless many of these were taken we could gather very little information of value. We have found it easy to catch adults at night in barns during the nesting season, using flash lights and long-handled nets. By this method on warm nights in the latter part of June, when most of the young are fairly well grown, as well as during the early part of August under similar conditions for the second brood, we have caught and banded many adults without harming the young. Usually every bird in a barn can be caught in this way, and it is exciting as well as informative. Two teams of two persons each get the best results; one member of each team with a five-celled flash light and one with a net, one team at each

end of the barn. Another pair in the middle would be useful in a barn one hundred feet long, though not at all necessary. We look over a barn carefully and make our plans during daylight and then wait outside until after dark, when we enter and close doors and windows without turning on any lights or causing any disturbance if possible, for otherwise some Swallows may fly out before we get the openings closed. Frequently even before we flash on the lights some of the birds are fluttering, and an exciting time follows as the birds are caught and transferred to gathering cages. The light seldom attracts the birds, but merely disturbs them so that they flutter about like moths and are easily caught. As many as fifteen or twenty birds in a gathering cage have never yet injured one another. Our experience indicates that a stormy night will mean fewer birds in barns; just why we don't know, and undoubtedly they sometimes break this rule, but thus far it seems true that whenever possible a Swallow will stay out of a barn in stormy weather.

Our own barn has a loft running the whole length just under the ridgepole, with a window at one end. By taking a board out from the side of the loft, keeping the window closed, and shutting up the barn, and then creating a great disturbance on the scaffolds below, we have driven many birds into the loft and have caught them there with a butterfly net (see Figure 1). From July 15th to August 15th is the best time to catch birds in this way, and they are mostly juveniles. We have also found that when a good crop of hay is put into a barn, a loft is artificially made, and birds can be caught during the day by shutting the windows and doors and having two or more catchers stationed up in the hay with nets. We have caught about one thousand birds on the wing by one of these methods during four summers. The length of the net-handle varies with the space in which it is to be used, but it should be light and stiff, not "willowy." We have several nets with handles of different lengths. The best diameter is about twenty inches, and the net should be sufficiently deep to allow the bag to fold over the rim. Ordinary cloth mosquito-netting has been very satisfactory material for the net, with No. 9 wire for the rim. One of our best net-handles was made from a sapling. It may be said here that in catching a bird on the wing in daylight one should not swing the net at an approaching bird, for there is too much chance of injury. Adults, which fly much faster than juveniles, can best be caught by suddenly lifting the net in the path of an oncoming bird without giving it time to dodge, while juveniles can be caught from behind by swinging the net faster than they are going.

Most of the birds which are seen in barns during the daytime from July 15th until they all leave for the South are juveniles, though there are some adults that have young in the barn. Adults can be caught much more easily and in larger numbers at night


17
TOWNSEND HARBOR
N
W
E
S
GROTON to 17
1 LAFAVE (N.LEOMINSTER)
2 GALLINEAU (N.LEOMINSTER)
3 SANDERSON (SHIRLEY)
4 INDUSTRIAL SCHOOL (SHIRLEY)
5 DAVIS (SHIRLEY)
6 POLLARD (HARVARD)
7 GREENE (HARVARD)
8 DUNN (SHIRLEY)
9 HARRIS (SHIRLEY)
10 HARTWELL (SHIRLEY)
11 POUTENIS (SHIRLEY)
12 JUBB (SHIRLEY)
13 E. GRAVES (SHIRLEY)
14 N. GRAVES (SHIRLEY)
15 LONGLEY (SHIRLEY)
16 CUMMINGS (SHIRLEY)
17 HAGAR (TOWNSEND HARBOR)
17 to 14
MAP SHOWING LOCATIONS OF BARNS VISITED AND SOME RECAPTURE RECORDS. RECORDS IN GROTON MADE BY W. P. WHARTON.
SHIRLEY VILLAGE to TOWNSEND HARBOR
7 3/4 MILES
SHIRLEY VILLAGE to AYER
3 1/2 MILES
16
15
SHIRLEY CENTER
14
13
12
11
10
9
8
GROTON to 5
AYER to 7
AYER
14 to 5; 5 to 14
9 to 5
5 to 9
SHIRLEY VILLAGE
2
2 to 5
1
1 to 5
AYER to 4
7 to GROTON
6 to GROTON
5
4
3
3 to 5
4 to 5
4 to 7
6 to 5
7
6

during the time that the young are in the nest, for juveniles seldom stay in a barn at night, and for that matter adults do not do so if they seemingly can find any excuse to stay away. Several times we have visited a barn at night where there were more nests with young in them than there were adults in the barn (allowing one adult per nest).

Barn Swallows are very successful in hatching their eggs and raising their young, of which there are ordinarily four or five in a nest, though we have found as few as one. Six young are not uncommon and we have recently found our only nest (one out of about four hundred) with seven young in it. Not over five per cent of the eggs are infertile, and very rarely indeed have we found two infertile eggs in one nest. Once hatched, practically every young bird lives to leave the nest. The danger time in this period appears to be when they are about ten days old. Occasionally we find a young bird of that age that has fallen out of the nest and is dead on the floor below. All our observations indicate that this is the result not of being pushed out by the other young, but possibly of poorly coördinated muscles combined with strong phototropism. It seems unlikely that more than two or three per cent of the young are lost this way. We have never found any young dead as a result of bad weather or because the parents could not gather food.

Parasites are very scarce; we have only one record of a maggot in a nest and only one nest which had mites. In this latter case, when the young reached that ten or twelve day age when we occasionally find them dead on the floor, they all jumped out and were killed. The mere fact of a young swallow being a runt in a nest does not imply that it will not grow satisfactorily; H20532 on July 19, 1932, was only half the size of the rest in the nest, and we nearly decided not to band it, but on August 9th we caught it as a juvenile appearing just as healthy as any other bird.

When the young birds leave the nest, they usually do not stay long in the vicinity, though there are many exceptions to this rule. It seems as if there must be a very heavy mortality among the young at this time, for we have never observed a brood that kept together outdoors for more than a day or two, though of course single birds may be fed much longer. Consequently any bird that cannot at once catch its own food has almost no chance to survive. With a species which is so successful in bringing its young to the flight stage we should have over-population if it were not for a high death-rate at some stage after leaving the nest, and this critical period offers a possible explanation of when the loss may occur.

After getting on the wing the juveniles spend some time wandering about the country, going into different barns (see Table 1, also note in *Bird-Banding*, Vol. IV, page 116).

TABLE 1

Juveniles visit various barns.

L35693	Banded as nestling in Hartwell barn,	June	21, 1935.
	Caught in Davis barn,	July	9, 1935.
	Caught in Davis barn,	August	6, 1935.
	Caught in Harris barn,	August	8, 1935.
L63145	Banded as juvenile in Davis barn,	July	22, 1934.
	Caught in Harris barn,	August	2, 1934.
L63131	Banded as juvenile in Davis barn,	July	21, 1934.
	Caught in Harris barn,	August	4, 1934.
L63093	Banded as juvenile in Davis barn,	July	16, 1934.
	Caught in Harris barn,	August	5, 1934.

Our records show that, if the weather is clear and warm, the juveniles will be in our barn about 8:30 or 9:00 A.M. sitting on ropes, etc., where they pass most of the rest of the morning quietly. If the weather is cloudy or rainy, the number that we catch in a day will drop from ten or twenty down to two or four; most of them do not come into the barn in bad weather. The only explanation we have is that possibly they have to take all their time outdoors in order to get enough to eat. The individual juveniles come from any direction (see Table 2) and the groups of juveniles in barns do not come back as a unit, but the make-up of the groups changes from day to day (see Tables 3 and 4), and, regardless of the weather

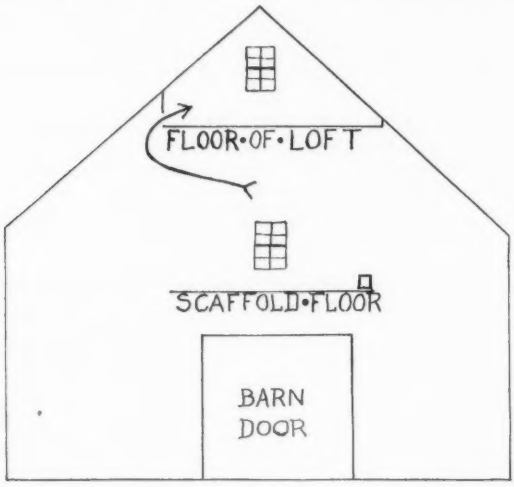


Figure 1. A skeleton view of the end of our barn. Juveniles stay on perches between the scaffold and loft floors. By making a disturbance there we drive them as indicated by the arrow and catch them in the loft with a net or against the window.

there are seldom many in our barn on any afternoon. We catch a few adults with the juveniles at this time of year—presumably birds which are not raising a second brood though this is not necessarily so. It surprised us to know that an adult nesting in one barn would be found in another barn during that period (see Table 5).

TABLE 2

Individual juveniles come from any direction.

35-1108	Banded as nestling at State Industrial School,	June 25, 1935.
	(Moved northwest) Caught in Davis barn,	August 4, 1935.
35-1032	Banded as nestling at Lafave barn,	June 17, 1935.
	(Moved east) Caught in Davis barn,	August 8, 1935.
L63593	Banded as nestling in N. Graves barn,	June 16, 1935.
	(Moved south) Caught in Davis barn,	July 16, 1935.
L63656	Banded as nestling in Hagar barn,	June 16, 1935.
	(Moved south) Caught in N. Graves barn,	August 9, 1935.
L63558	Banded as nestling in Harris barn,	June 16, 1935.
	(Moved southwest) Caught in Davis barn,	July 26, 1935.
H91475	Banded as nestling in Pollard barn,	June 15, 1934.
	(Moved west) Caught in Davis barn,	July 19, 1934.
H24794	Banded as nestling in Sanderson barn,	June 13, 1934.
	(Moved north) Caught in Davis barn,	August 4, 1934.

TABLE 3

Group of juveniles in barn one day does not come back as a unit.

July 23, 1934. 11 Juveniles, caught in barn, 4 repeat on 24th, 1 on August 14th.
August 2, 1934. 20 Juveniles, caught in barn, 1 repeat on August 4th.
July 18, 1935. 6 Juveniles, caught in barn, 1 repeat on August 8th, 1 on August 11th.
July 23, 1935. 6 Juveniles, caught in barn, 1 repeat on August 13th.

TABLE 4

Groups of juveniles in barns change from day to day.

August 3, 1935. 7 Juveniles caught, No repeats.
August 4, 1935. 16 Juveniles caught, No repeats.
August 5, 1935. 4 Juveniles caught, No repeats.
August 6, 1935. 4 Juveniles caught, No repeats.
August 7, 1935. 8 Juveniles caught, One repeated on the 8th.

TABLE 5

An adult nesting in one barn may go into another barn in the daytime.

35-1113	Banded at State Industrial School at night on	June 25, 1935.
	Caught in Davis barn during the day on	July 30th.
	Caught at Industrial School at night on	August 8th.
	Caught in Davis barn during the day on	August 14th and 15th.
L35544	Adult female. Banded at Industrial School at night on	June 16, 1934.
	Caught in Davis barn during the day on	July 29, 1934.
	Caught at Industrial School at night on	August 1, 1934.
L63433	Banded at Industrial School at night on	June 25, 1935.
	Caught in Davis barn during the day on	August 5th.
	Caught at Industrial School at night on	August 8th.
	Caught in Davis barn during the day on	August 14th.

It is becoming more and more evident that Barn Swallows do a great deal of wandering and enter during the day time many barns

in which they have no nests. From May 8th to June 12, 1936, we have caught 48 adults in our barn, yet there are only 8 nests being used. And as late as June 12th, we were catching an occasional pair in the loft, acting as though they were not yet settled anywhere, although they may just as likely be an incubating pair from some other barn (see Table 5).

It seems evident that some of the birds in the barn at night up to the time nesting starts in the spring are wanderers, for the results of catching the birds every other night before they have begun laying show constant changes both in numbers and in individuals. On the night of May 6, 1934, there were six birds in the barn, on the 8th there were eight birds, and on the rainy night of the 10th but six birds were there, and only four of these last had been there on either of the previous vists. This year there were thirteen birds on the night of May 8th, and only seven of these were present on May 10th along with four new arrivals. The rainy night of May 12th found only seven birds in the barn, of which four were repeats from the other nights and three were not caught.

We have as yet no idea why Swallows seem to put an arbitrary limit on the number of pairs that will nest in a barn, and hold pretty close to that number. Our barn, one hundred feet long, never has had over ten nesting pairs, and so far as we know, never less than eight. The Boutilier barn, about equal in size, has no nests. The Hagar barn, fifty feet long, has always fifteen to twenty occupied nests, while the Dunn barn of similar size has only two or three nests year after year.

As already stated, the birds nesting in a barn are not always there at night, and we have no record of catching at night a total of two adults for each occupied nest in a barn. Although at times we have come fairly close to that maximum, at other times we have fallen far short of it. What proportion of birds nesting in a barn will return to nest the following year is something upon which we have not yet adequate information, but at the present time it seems to be somewhat under 50 per cent on the average.

Eventually it may be possible to get some valuable information concerning the distribution of nestlings the following nesting season. This will require working over as large an area as possible, but since Mr. W. P. Wharton is looking out for the swallows in the Groton area, which borders on the Shirley area, there is good reason to be hopeful. Already we are picking up each other's birds from time to time. The only actual information of any value which we have up to the present concerns a brood of five nestlings banded on July 17, 1935, at the Shirley Industrial School (No. 4). One of these birds, L63688, is quite evidently nesting in our barn (No. 5) this year (it was caught at night on May 8th, and in the daytime on June 17, 1936; good evidence but not quite convincing); another one of the brood is nesting in the Green barn (No. 7) in Harvard,

Massachusetts, (about four miles away) having been caught there at night on June 18, 1936. There is also our record of two birds from a brood banded in the N. Graves barn (No. 14) last year which appeared in our barn in the daytime on successive days this spring. We have no idea, however, of the ultimate destination of these two birds; it is doubtful if they stayed with us. Our various return records of individual nestlings prove nothing at the present time other than that a young bird may return to the barn in which it was hatched or go elsewhere.

The locations of the barns we have visited are shown on the accompanying map, and these are most of the barns in the local Shirley area in which Swallows nest. There are, we believe, no barns south of the Sanderson barn (No. 3) having nesting Swallows, for a distance of about five miles, nor are there any within three miles of us to the east.

Conclusions are risky with Barn Swallows, for they seem constantly to break rules, but the work is fascinating and the results as they accumulate have been most interesting. We hope to be able to continue from year to year and trust that others also will try some intensive work with this species.

Shirley, Massachusetts.

SUMMARY AND ANALYSIS OF SOME RECORDS OF BANDED OSPREYS

By C. Brooke Worth, M.D.

Lincoln, in *Bird-Banding*[1], reported that up to July 1, 1936, 637 Ospreys (*Pandion haliaëtus carolinensis*) had been banded, and that 46 returns had been received.

This paper is a report of the Ospreys banded by Buckalew, Wilcox, Gillespie, and Worth, who, in that order, have been most successful in banding Ospreys, having tagged a total of 369 up to January 1, 1936, or somewhat over half of the entire number. They have had 47 recoveries to date, 43 of these up to July 1, 1935.[1]

Mention is also made in this report of six additional Osprey returns cited by Lincoln in the same article in *Bird-Banding*.

Herbert Buckalew has done by far the most extensive work, having banded many adult Ospreys, whereas, so far as I can discover, all other workers have confined their attention to fledglings in the nest. Buckalew uses a noose baited with fish and attached to a heavy log. He sets these snares along an exposed beach.[2]

He has banded 149 birds, all in Delaware. Of these, 26 were

[1]Vol. VII, pp. 38–45, 1936.
[2]*Eastern Bird-Banding Quarterly*, Vol. I, pp. 4–5, 1934.

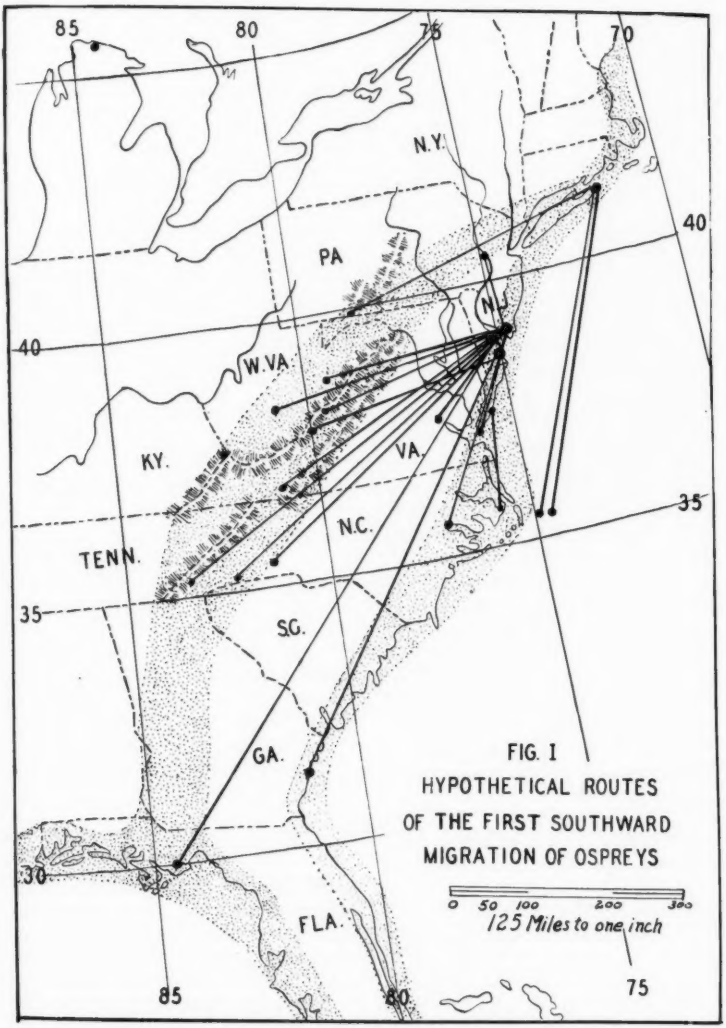


FIG. I
HYPOTHETICAL ROUTES
OF THE FIRST SOUTHWARD
MIGRATION OF OSPREYS

fledglings and 123, adults. He has had 23 recoveries, 3 of nestlings and 20 of adults. Of the 20 adult recoveries, 16 were birds which returned in subsequent years to Delaware; the other 4 were as follows:

1. A709807, shot on the Virginia Coast during the Delaware breeding season;
2. A719072, shot in North Carolina during the Delaware breeding season;
3. A719002, shot in Jamaica, British West Indies, in March, and therefore possibly during its normal winter sojourn there;
4. A719077, shot in the Gulf of Venezuela near the end of June. This bird was an adult; it seems to have failed entirely to migrate northward at the normal time.

Buckalew has, therefore, recovered about 16 per cent of his adult banded Ospreys, though this high percentage is obtained in large measure by his having retrapped seven birds in subsequent years. Five were drowned in staked fish-nets off the Delaware Coast.

Of Buckalew's recovered adults, 80 per cent had returned to their breeding territory, 15 per cent definitely had not, and the remaining 5 per cent (1 bird, in Jamaica) might have, had it not been shot in winter.

Leroy Wilcox has banded 77 Ospreys, all fledglings. Thirty were banded on Long Island, New York and 47 on Gardiner's Island, New York. He has had only three recoveries.

John A. Gillespie has banded 73 fledglings, 68 in New Jersey and 5 in Delaware. He has had 8 recoveries.

C. Brooke Worth has banded 70 fledglings in New Jersey and has had 13 recoveries.

Recoveries of nestlings banded by these four coöperators total only 11 per cent, compared with 16 per cent among Buckalew's adults. Of nestling recoveries, about a quarter occur near the nesting-site soon after the banding date and appear to be casualties during the time when the birds are inexpert flyers. Thus only 8 per cent of nestlings yield recoveries of significance so far as migration is concerned. On the other hand, if all coöperators trapped adults, this figure would probably be augmented, though Buckalew has not retrapped any birds which he banded as nestlings. Two of Gillespie's nestlings banded in New Jersey were recovered two and three years later respectively in New Jersey. One of his and one of Worth's were recovered in Virginia during the New Jersey nesting season in years subsequent to banding.

A number of years ago Gillespie[3] conceived the idea that juvenile Ospreys on their first southward migration pursued an inland route following the Appalachian mountain chain in order to find calm waters in which to fish and also to avoid the autumnal storms of the coast. The data now available on this subject are as follows:

Eighteen Ospreys have been recovered in their first southward flight; of these eleven have been inland and seven have been coastal. The inference must therefore be that both routes are used, though

[3] *Eastern Bird-Banding Quarterly*, Vol. I, p. 4, 1934.

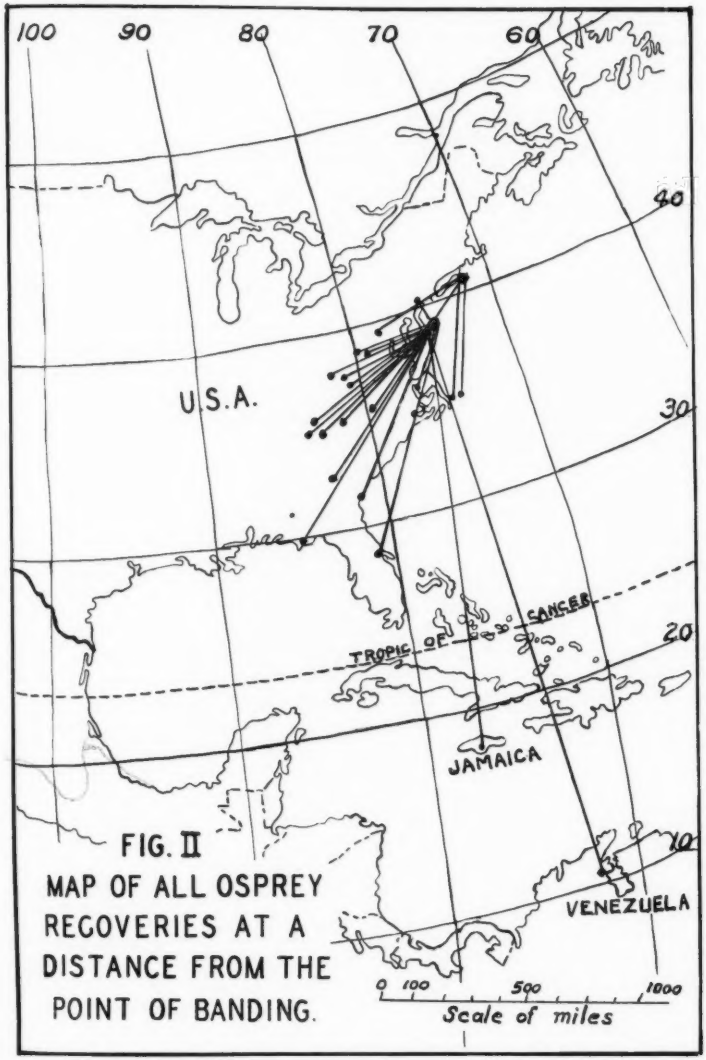


FIG. II
MAP OF ALL OSPREY RECOVERIES AT A DISTANCE FROM THE POINT OF BANDING.

the inland one seems to be given preference. Two of the coastal birds have been recovered by ships sixty to seventy miles off Cape Hatteras, North Carolina, and these seemed definitely to have been in distress (A727056, banded by Beals, and 422611, banded by Wilcox, both on Long Island, New York). Further evidence for the inland route is found in the observation of Ospreys at Hawk Mountain, Pennsylvania. Broun[4] reports that "Ospreys sailed down the ridge at infrequent intervals from September 15 to October 11. Ten individuals flew by on October 7, but it was usual to see one or two a day."

Figure I shows the two probable routes on the first southward migration.

Of the adult Ospreys banded by Buckalew only two were recovered during the fall migration period (A709808 on September 23, 1932, and A719005 on August 20, 1935), and neither of these had begun to migrate. It thus remains unknown whether any proportion of southward-migrating adults use the inland route. Presumably, however, they are strong of wing by then and can migrate competently along the coast, though this is mere speculation.

Two Ospreys have been recovered twice. A721063, banded by Gillespie on August 20, 1933, had its nest destroyed by a hurricane on August 22, 1933 and was found buried in the overturned structure by Worth on August 23, 1933. He took it home and reared it by hand. It was released at St. Davids, Pennsylvania, and was last seen there on October 14, 1933. Its leg with the band attached was found at Edenton, North Carolina, on May 1, 1934. A700308 was banded by Worth on August 10, 1929 and was found with a broken wing in North Carolina on September 18, 1929. It was taken home and the broken wing was splinted until it healed; then it was released. It was caught in a padded steel strap in Florida on January 2, 1932. It was taken home over night and then released; it could fly perfectly and had a five-foot wing-spread.

The longevity record for any bird, as far as the Biological Survey's records are concerned, is held by an Osprey, as reported by Lincoln in the aforementioned number of *Bird-Banding*. This was ABBA-26584, banded at Gardiner's Island, New York, on June 19, 1914 by Cleaves and found dead there on June 1, 1935. It was banded as a nestling.

The distance record for an Osprey is A719077, banded as an adult at Slaughter Beach, Delaware, on April 26, 1934, by Buckalew, and killed at El Mojan-Estado, Zulia, Venezuela, South America, on June 28, 1935. This record is also cited by Lincoln in *Bird-Banding*.

Figure II shows all Osprey recoveries at a distance from the point of banding.

602 W. Elm Avenue, Swarthmore College, Swarthmore, Pennsylvania.

[4] "The Hawk Migration during the Fall of 1934, along the Kittatinny Ridge in Pennsylvania," *The Auk*, Vol. LII, pp. 233–248.

THE AVERAGE AGE OF THE EASTERN PURPLE FINCH

AN ESTIMATE BASED ON RETURNS AND RECOVERIES

By M. J. MAGEE

IN the October, 1928, number of *The Bulletin of the Northeastern Bird-Banding Association* (Vol. IV, No. 4, p. 132), I stated, "I do not believe the average life of the Purple Finch (*Carpodacus* P. *Purpureus*), eliminating the mortality among the young before they are able to fly, is much, if any, over two years."

Up to the time the above was written, June 30, 1928, I had banded 7,243. Now, June 30, 1936, with a record of 17,846 Purple Finches banded[1] I have not changed my opinion. I base this conclusion on the fact that the number of Purple Finches returning later than the second year after banding falls off very rapidly, and after the fourth year after banding the number is reduced to just a few scattering returns.

One objection that may be raised to my opinion as to the average life not being much, if any, over two years, is the fact that with the great majority at the time of banding the age cannot be definitely determined, but must be entered on my records as "so old or older."

From the thousands of Purple Finches banded at my station it would seem as though the young-of-the-year would be banded in large numbers. This, however, is not the case, as the great majority of my Purple Finches are banded in the spring. After nesting some young come to my station and are banded, but the great majority are not seen until the following spring, and then they cannot be distinguished from adult females by their plumage alone.

This year, 1936, up to June 30th, I have banded 884 Purple Finches. Of these 207 were crimson males. Certainly a large majority of the balance of 677 must have been 1935 birds.

To get data a little more definite as to average age I have gone over my records and studied all returns and recoveries to date, June 30, 1936, of all Purple Finches banded as young-of-the-year in 1927, 1928, 1929, 1930, and 1931. I stopped at 1931 for the reason that it would allow the young of 1931 to reach their fifth year in 1936.

The result:

No. return after			1st	year after		banded	62	Years for averaging			62
"	"	"	2d	"	"	"	50	"	"	"	100
"	"	"	3d	"	"	"	11	"	"	"	33
"	"	"	4th	"	"	"	6	"	"	"	24
"	"	"	5th	"	"	"	3	"	"	"	15
"	"	"	6th	"	"	"	3	"	"	"	18
"	"	"	7th	"	"	"	1	"	"	"	7
						Total	136			Total	259

[1]On September 5, 1936 my total number of Purple Finches banded was 18,000.

This makes the average age for these 136 birds, definitely known to be young-of-the-year when banded, a little less than two years.

My return records indicate that I probably shall have no more returns from Purple Finches banded in 1922 to 1929, inclusive, thus:

	Banded	*Returned*	*Last year any returned*	*Number*
1922	254	40	1930	1
1923	1092	103	1928	2
1924	1043	116	1930	2
1925	1510	149	1932	1
1926	1084	135	1933	1
1927	1443	128	1934	1
1928	1283	100	1934	2
1929	1971	106	1936 (to June 30)	1
				11

LIST WITH AGES OF THESE ELEVEN LAST RETURNS

Year banded			*Age*
1922—Adult male when banded.	Trapped every year but one to 1930, inc.	10 years or older
1923—Adult male when banded.	Trapped every year to 1928, inc.	6 years or older.
Adult female when banded.	Trapped every year to 1928, inc.	6 years or older.
1924—Young male when banded.	Trapped 1926 and 1930.	7 years.
Adult male when banded.	Trapped only 1930.	8 years or older.
1925—Young male when banded.	Trapped every year but one to 1932, inc.	8 years.
1926—A 1926 female when banded.	Trapped 1928 and 1933.	7 years.
1927—Young male when banded.	Trapped every year to 1934, inc.	8 years.
1928—Adult male when banded.	Trapped every year to 1934, inc.	8 years or older.
Young male when banded.	Trapped every year to 1934, inc.	7 years.
1929—A 1929 male when banded.	Trapped every year but one to 1936, inc.	7 years.

The male banded in 1922 and last trapped in 1930 is still my oldest Purple Finch, ten years or older.

Since the fall of 1915 I have had food out the year round, and every year since 1922 large numbers of Purple Finches have been banded. A variation in the number banded does not necessarily mean a great deal of variation in the number that came in to feed. Some years I had more time to devote to banding than others, and several years I was away during several weeks in the spring, the time when the largest number of Purple Finches drop in. Some years they are delayed and, instead of starting to come in in March, do not begin to arrive in any number until well toward the last of April. When thus delayed they come with a rush, and I cannot take care of them all.

Possibly some years they come in in larger numbers than others, but I do not believe there is any very great variation from one year to another.

It is my opinion that the reproduction from year to year just about takes care of the destruction.

Sault Ste. Marie, Michigan.

ECTOPARASTIES AND BIRD DISEASES[1]

By CARLTON M. HERMAN

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DISEASES of birds can be classified in many ways, depending on the purpose at hand. Symptoms, causative agents, and pathology have no doubt received the most attention, but, from the standpoint of possible control measures, the manner of transference from an infected to a non-infected bird is probably the most important consideration. The avenues of infection of the numerous diseases of birds in nature vary as much as in man or any other animals. Conspicuous among these is the transmission of disease by ectoparasites. In this discussion ectoparasites include all animals which exist during at least a part of their life cycle on the body of the bird host. In many cases such an existence is necessary to the life of the parasites.

All bird-banders have probably at some time or other observed ectoparasites on the birds they are handling, but no doubt the significance of these pests is often not fully appreciated. In past issues of *Bird-Banding*, and in other ornithological journals, there have been several papers on the ectoparasites of birds. The destructive activities of Protocalliphora are well known. Although a great deal of work has yet to be done to complete the picture, there has already been sufficient research on many of these parasites to give us a fair conception of their importance.

Blood diseases require bloodsucking parasites to transmit the causative agents from one host to another. The most common blood infections are probably the malarias, of which there are two types prevalent in birds, both caused by protozoan parasites. One group belongs to the genus *Plasmodium*, the genus which causes malaria in man. This form is transmitted by mosquitoes, a fact that was discovered with birds before it was known for the human disease. The infection in man is transmitted by the anopheline mosquitoes, that in birds by the culicine. Mosquitoes also may be the transmitting agents of filarial worms in birds, as they are in man.

The other type of malaria in birds is due to infection by the genus *Hæmoproteus*, which has been authentically reported from mammals and which is also known to occur in reptiles and amphibians. This blood-stream infection has been shown to be transmitted by hippoboscid flies in Domestic Pigeons, Eastern Mourning Doves, (*Zenaidura macroura carolinensis*) and California Valley Quail (*Lophortyx californica vallicula*). Further research may show

[1] Contribution No. 23, Austin Ornithological Research Station.

these flies to be the transmitting host of this common infection of other birds as well.

Another protozoan parasite often encountered in the blood of birds is *Leucocytozoön*, a cause of severe losses of ducks in certain regions of the country. Although it also occurs in many species of passeriform and other birds, the course of the infection has thus far been studied only in Geese, Ducks, and Domestic Turkeys. Blood-sucking black flies of the genus *Simulium* have been shown to be the vectors in the Ducks and Turkeys, but whether or not these flies are responsible for the spread of the disease in other birds has not been determined.

It has been suggested in a recent paper[1] that hippoboscid flies may be the cause of loss of feathers. In view of the fact that these are bloodsucking flies and not feather-eaters, this implication is open to question. Neither hippoboscid nor black flies have ever been known to cause ill-health in birds from direct loss of blood.

With Protocalliphora the picture is quite different. These flies have not been implicated as the vectors of any infectious disease, but, when present in sufficient numbers in a bird's nest, the larvæ often suck enough blood from the young birds to bring about their death. This has been shown to be true particularly with birds that utilize man-made nesting-boxes, such as Bluebirds (*Sialia s. sialis*) and Tree Swallows (*Iridoprocne bicolor*).

Of interest, also, are two diseases of the digestive tract, ulcerative enteritis and botulism. Flies have been shown, experimentally, to be capable of carrying the causative virus of ulcerative enteritis. Infection in this case is by means of the bird's eating infected flies. However, this fatal disease, which has been reported in epidemic form from Ruffed Grouse and other birds, is more commonly obtained through fecal contamination, the birds contracting the disease directly by ingesting the droppings of infected individuals. Botulism also may be transmitted by flies, infection resulting from the birds' having eaten decayed meat or the maggots of flies which had fed on infected meat.

Ticks have been shown to transmit tularemia from rabbits to Grouse and other game-birds, as well as from one bird to another. Ticks are most common on game and other ground-feeding birds, but many of the perching birds have also been found infested.

Two types of lice occur on birds. One group lives on feathers; the other obtains its subsistence from the blood. A bloodsucking louse which occurs on man is responsible for the transmission of typhus fever. There has been no evidence as yet that the bloodsucking lice of birds disseminate any disease among them. However, as with the mites discussed below, it is well to bear in mind that although very

[1] Michener, H. and J. R. 1936. Abnormalities in birds. *Condor*, 38 : 105.

little research has been done on these forms they are, being blood-suckers, potential carriers of disease.

Mites also can be divided into two groups—those that live on feathers and those that get their nourishment from the blood of the host. The feather-eating lice and mites, though not implicated as vectors of disease, nevertheless in cases of heavy infestation cause much destruction to feathers and are a source of much annoyance and irritation. The mites which live on bird blood have not as yet been proved to be the transmitting hosts of any disease. Closely related mites are known to be the transmitting hosts of *Hepatozoön muris*, which occurs in rodents. A very similar blood parasite causes toxoplasmosis in birds—a common disease of English Sparrows which has been little studied in this country. During the past summer at the Austin Ornithological Research Station the disease has been observed to occur in a Kingbird (*Tyrannus tyrannus*), English Sparrows (*Passer d. domesticus*), and several other Fringillids, and subsequent investigation may reveal more cases.

Fleas, another group of ectoparasites of birds, have not as yet been shown to be implicated in the spread of disease. In man they are the vectors of bubonic or black plague, which has spread in epidemic form in past centuries, causing whole cities to be wiped out by the "Black Death." The causative agent of this disease is a bacterium of the *Pasteurella* group. A bacterium of this same group occurs in birds—causing the equally fatal bird cholera—which often spreads in epidemic form, particularly among birds confined to limited space, such as at breeding farms or in experimental laboratories. I have observed an epidemic of this disease in laboratory canaries being used in malaria studies, where the most likely vector appeared to be mites which were present. Although several other investigators have observed such epidemics and also believe mites are responsible, experimental proof is lacking.

As well as occurring on the birds, many ectoparasites can often be found in their nests. This is particularly true of Protocalliphora larvæ. Hippoboscids may also have the pupal stage in the nest-material, but these would be difficult to find among the débris unless they should occur more abundantly than I have observed. Although I have flushed as many as eighteen flies from a single young Cowbird (*Molothrus a. ater*), such numbers are uncommon. However, fleas and mites are quite abundant in nests. Flea larvæ have been observed in great numbers in the nest débris, and adult fleas also have been found there, as many as forty-two having been obtained from one Bluebird's nest. A large number of nesting-boxes, which had been occupied by Tree Swallows, Bluebirds, and Chickadees (*Penthestes a. atricapillus*), were examined during the past summer and found without exception to be infested with mites. These ectoparasites are hardly larger than the point of a pin, and, unless they are very active, are almost impossible to see with the naked eye.

However, so many mites are seen when a small amount of the dust from the bottom of a nest-box is examined under a microscope that an estimation of billions in each nest seems conservative. The mere emptying of the old nest-material does not get rid of these minute creatures, since they can find security by squeezing into the finest crevices. They are readily killed by kerosene or creosote. Dipping nest-boxes into such a germicide might prove advantageous, particularly when birds are likely to use the nest-box a second time in the same season.

No method of reducing the ectoparasite population of wild birds seems practical. Nevertheless, removing these parasites from the birds whenever observed will undoubtedly relieve the individual greatly. Ruffling the feathers will usually frighten out the flies, but it is a difficult task to capture the lice and mites. Various insect powders can be useful, but these are usually harmful to the eyes. Since the neck and head regions are favorite habitats for the ectoparasites, great care should be exercised in the use of such insecticides.

North Eastham, Cape Cod, Massachusetts.

THE MIGRATION OF THE WESTERN BURROWING OWL

(*Speotyto cunicularia hypogæa*)

By J. F. BRENCKLE

THE Western Burrowing Owl is found on the dry plains west of the Mississippi River to the Pacific Ocean, and from Panama and the Gulf of Mexico north to the southern margin of Canada, and east to Minnesota and western Iowa. It is migratory north of Oregon and northern Kansas. On this vast area but five stations have reported banding this bird, but a total of five hundred and seven bandings have been recorded and are here considered.

The banding records of Mr. Emerson Stoner (personal communication) indicate that little or no migratory movement takes place in California. He writes: "I have never considered that our nesting Burrowing Owls migrate, as there seem to be about the same number of birds here throughout the year. All the following were banded in or not over two miles from Benicia, Solano County, California." He has banded twenty-six during the past six years while studying their nesting-habits, and records three repeats, and one recovery.

No. 24451, banded May 9, 1930, was recaptured April 23, 1932, in the same field.
A514898, banded May 21, 1931, was found dead March 28, 1934, about six miles from place of banding.
A514900, banded April 23, 1932, was recaptured April 23, 1933, in the same field.
A514907, banded April 23, 1932, was recaptured April 23, 1933, in the same field.

Mrs. Anna Benson, of Fruita in western Colorado, reports banding two birds, one of which was found dead near by shortly after banding.

In the Dakota plains area we have known for many years that the Burrowing Owl did not remain with us during the winter. In "Birds of Minnesota," (Vol. I, p. 618) Dr. Roberts gives the dates of migration as April 10th to April 27th and October 7th. For our area I should give the earliest occurrence as April 1st, and October 20th as the latest. From banding recoveries now at hand a well-defined wintering area is definitely indicated in central Texas and adjoining Oklahoma.

Nesting and summer residence begins sparsely just north of the wintering area, and occurs oftener as we go northward to the Dakotas where we undoubtedly have the densest nesting population. Mr. William Wells, of Colony, Kansas, records only one pair of nesting Burrowing Owls in many years of observation. (*Oologist*, Vol. LII, September, 1935, p. 106.)

Mr. Burt Gresham of Winnipeg writes that the Burrowing Owl is not common in Manitoba. He banded two young on July 31, 1926. One of these, 368148, was shot at Spaulding, Nebraska, September 24, 1927, a year and two months after banding.

Mr. Glenn Berner of Jamestown, North Dakota, reports one interesting return and two recoveries from one hundred and one bandings during the years 1933 and 1934.

At my station three hundred and seventy-six Burrowing Owls were banded during the years 1931 to 1934, most of them within four miles of town, but a few as far as nine miles away. Eleven distant recoveries and one return have been recorded. There are also eighteen local recoveries due to death or injury of banded birds. Most of these casualties occurred at night, and were caused by cars on the highways near the nesting-sites. The roadways seem to be favorite hunting-places for these birds.

In evaluating the recoveries both the date and the place of recovery must be considered. The following nine recoveries clearly outline the wintering territory of the Great Plains residents.

No.	*Date banded*	*By whom*	*Recovery*	*Where recovered*
A515489	June 27, 1931	J. F. Brenckle	Captured January 7, 1932	Gunther, Texas
A544093	June 21, 1933	J. F. Brenckle	Killed by hail April 3, 1935	Snyder, Texas
A568860	June 25, 1933	J. F. Brenckle	Killed December 11, 1934	Lott, Texas
A568894	July 18, 1933	J. F. Brenckle	Killed October 11, 1933	Gasoline, Texas
A568899	July 18, 1933	J. F. Brenckle	Found dead October 14, 1934	Flatonia, Texas
A515484	June 27, 1931	J. F. Brenckle	Captured December 12, 1932	Edmond, Oklahoma
A544057	June 29, 1932	J. F. Brenckle	Found dead April 4, 1933	Willow, Oklahoma
B622725	July 9, 1933	Glenn Berner	Shot October 5, 1933.	5 miles west of Moore, Texas
A544987	July 9, 1933	Glenn Berner	Shot October 5, 1933	10 miles west of Wichita, Kansas

The following two owls were evidently in migration to their winter quarters when captured:

368148	July 31, 1926	Bert Gresham	Shot September 24, 1927	Near Spaulding, Nebraska
A519449	July 1, 1931	J. F. Brenckle	Injured on road, October 1, 1931	Royal, Nebraska

The two following returns after an interval of one and two years are of interest:

A544999	July 11, 1933	Glenn Berner	Recaptured at same den August 1, 1934	Jamestown, North Dakota
A515497	June 29, 1931	J. F. Brenckle	Found dead in same field August, 1933	Northville, South Dakota

The following recoveries were trapped or shot after their spring arrival in the North:

A544070	July 10, 1932	J. F. Brenckle	Shot April 24, 1934	Near Columbia, South Dakota
A568858	June 25, 1933	J. F. Brenckle	Trapped and released April 29, 1934	McVille, North Dakota
A568829	June 24, 1933	J. F. Brenckle	Trapped and released April 12, 1934	Kamrar, Iowa

Northville, South Dakota.

NIGHT LIGHTING WITH BOB-WHITE

(*Colinus virginianus virginianus*)[1]

By THOMAS HUME BISSONNETTE

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AN extension of experiments on the modification of sexual cycles in starlings, ferrets, and pheasants, previously reported (Bissonnette, 1933, 1935, 1936a, b; Bissonnette and Csech, 1936a, b) was carried out with Quail (*Bob-white, Colinus virginianus virginianus*) to ascertain whether or not their sexual or breeding period could be moved forward into the earlier spring months by increasing the daily periods during which they were exposed to light in winter and early spring. Tests were also made of the fertility and hatchability of the eggs so produced, and of the number of eggs that might be obtained from a single female under these conditions. Pheasants had shown remarkable susceptibility to induction of early laying by alteration of the seasonal cycle of daily period of illumination coupled with a great increase in the number of eggs laid by females under experimental treatment (Bissonnette and Csech, 1936b). Over 103 eggs each were laid by three hen Pheasants between January 15 and June 29, 1936, and two of these hens were still laying intermittently at that time.

Controls consisted of several pairs of Quail of the Wisconsin strain of this species at the Shady Swamp Sanctuary, Farmington, Con-

[1] Aided by grants from the National Research Council, Committee for Research in problems of Sex, 1935–6, and the coöperation of the Connecticut State Department of Fish and Game. Mr. Earl E. Bailey, Trinity College, assisted with the electrical arrangements.

necticut, housed and fed in the routine manner in operation at the breeding grounds there.

A single pair of these birds was confined in a pen similar to those used for the Pheasants (Bissonnette and Csech, 1936b) and lighted in the same way. The light from the 60-watt bulb used illuminated the whole pen whenever it was turned on. This was done by an electric time switch after nightfall for three hours per night from December 16th to 26th; for four hours till January 6th; and for five hours per night thereafter. Birds were fed and tended in the same manner as the controls. Both experimental animals and controls were exposed to daylight each day normal for the season.

No changes of plumage nor of head furnishings were noted in the experimental birds before laying began. So such criteria of the effectiveness of the increased lighting upon the sexual cycle as occurred in the male Pheasant were lacking.

The experimental bird began to lay on March 22d, and continued till May 20th, during which time she laid twenty eggs at rather irregular intervals. Of the first seven eggs laid, two hatched out at a day or more over the usual incubation period. Of the next nine set, six were fertile and four hatched. The hen died on June 19th from unknown cause. She had laid 38 eggs the previous season under normal seasonal conditions.

Controls began to lay about the usual time, on May 19th.

It is therefore evident that the laying season of this strain of Quail in this locality is conditioned to some degree by relative length of day and that early laying of fertile, hatchable eggs may be induced by prolonging the periods of exposure to light in winter and early spring. Sexual activity of both sexes is therefore controllable with the technique described, though not to such a marked degree as is that of Pheasants. Increased egg production was not induced in the single hen used in this experiment as it was with the Pheasants. This phase of the problem requires further study in view of the premature death of the hen involved.

SUMMARY

Increasing the daily period of exposure to light between December 16th and June 19th up to five hours per night with electric light from a 60-watt bulb induced a pair of Quail to begin to lay fertile hatchable eggs from March 22d onward. Controls began to lay at the usual time on May 19th. Total egg production was not increased as it was with Pheasants, but the hen died prematurely on June 19th. This method may be used to obtain early chicks from Quail for restocking depleted game preserves.

BIBLIOGRAPHY

BISSONNETTE, T. H.
1933. Light and Sexual Cycles in Starlings and Ferrets. *Quart. Rev. Biol.* 8(2): 201–208.

1935. Modification of Mammalian Sexual Cycles. III. Reversal of the cycle in Male Ferrets (*Putorius vulgaris*) by Increasing Periods of Exposure to Light between October Second and March Thirtieth. *Jour. Exp. Zoöl.*, 71(2): 341–373.

1936a. Sexual Photoperiodicity. *Jour. Heredity*, 27(5): 171–180.

1936b. Litters from Ferrets in January Induced by Increased Exposures to Light after Nightfall. *Am. Nat.*, 70(5): 454–458.

BISSONNETTE, T. H. and A. G. CSECH

1936a. Eggs by Pheasants and Quail Induced by Night-lighting. *Science*, 83(2156): 392.

1936b. Fertile Eggs from Pheasants in January by "Night-lighting." *Bird-Banding*, Vol. VII, p. 108.

GENERAL NOTES

Some Land Bird Recoveries from Mexico.—While selecting records for inclusion in the paper on returns of water birds from Latin America which appears elsewhere in this number, a few cases of recovery in Mexico of land birds came to attention. It is believed that none of these have previously appeared in print and accordingly, they are here given in detail for the benefit of those interested.

Mourning Dove. *Zenaidura macroura.*—An adult bird (B267045) banded at Lakin, Kansas, on June 21, 1933, by Preston F. Osborn, killed at Pénjamo, Guanajuato November 13, 1933.

Tree Swallow. *Iridoprocne bicolor.*—A fledgling (L48034), banded at the O. L. Austin Ornithological Station, North Eastham, Cape Cod, Massachusetts, on June 16, 1935, was reported by U. S. Ambassador Josephus Daniels as recovered at San Geronimito, Municipality of Palizada, Campeche,on March 16,1936.

Yellow-headed Blackbird. *Xanthocephalus xanthocephalus.*—A juvenile bird (A292940), banded at Great Falls, Montana, on June 7, 1932, by Vernon L. Marsh, was found dead at Camargo, Chihuahua, on March 1, 1935.

Black-throated Green Warbler. *Dendroica virens.*—An immature bird (34-75026), banded at Overbrook, Philadelphia, on October 4, 1934, by Henry P. Bailey, was shot by an Indian at Tetela, Oaxaca, about April 1, 1936. This record also was reported by Ambassador Daniels.

Clay-colored Sparrow. *Spizella pallida.*—An adult bird (L53083), banded at Northville, South Dakota, on May 2, 1934, by J. F. Brenckle, was found dead on December 23, 1934, at Cuautla, Jalisco.

White-crowned Sparrow. *Zonotrichia leucophrys.*—An adult (34-112582), banded at Jamestown, North Dakota, on May 8, 1934, by Charles C. Boardman, was captured at Rancho Nuevo, Coahuila, about March 25, 1935.—FREDERICK C. LINCOLN, Biological Survey, Washington, D. C.

Further Evidence on Blue Jay Migration.—In view of recent discussions on the migratory activities of the Northern Blue Jay (*Cyanocitta c. cristata*) and the now common belief that a north-and-south movement of this species takes place in spring and fall, the present record is offered as affirmative evidence on that point.

A Northern Blue Jay—obviously a bird of the year—captured August 31, 1927, in a Government sparrow-trap located on my lawn in Iowa City, Iowa, was banded as No. 522155. On January 7, 1928, a little more than four months later, this bird was found dead at Hot Springs, Arkansas, by J. M. Caldwell. The point of recovery is approximately 475 miles, air-line, almost due south of the point of banding. The distance seems to be too great to allocate this individual in the category of a "casual' at Hot Springs.

Taken in conjunction with the five records cited by Dr. T. S. Roberts (*The Birds of Minnesota*, II, 62, 1932) of Blue Jays banded at Minneapolis, Minnesota, and recovered in the States of Missouri, Arkansas, and Texas, the record here pre-

sented gives corroborative evidence of at least a southerly movement of the species even on the part of first-year individuals.—DAYTON STONER, New York State Museum, Albany, New York.

Indigo Bunting Returns-1 and Returns-2 at Nashville, Tennessee

Year	*Number of Birds Banded*	*Number Returning*
1932	15	0
1933	16	0
1934	42	2
1935	51	17
1936 (to July 15th)	22	19

RECORD OF INDIVIDUALS

Band No.	*Age—Sex*	*Date of Banding*	*Return-1*	*Return-2*	*Repeats*
H73023	♀	July 6, 1933	September 9, 1934		7
H73036	♂	August 30, 1933	May 14, 1935	May 14, 1936	17
H73045	Ad. ♂	October 9, 1933	May 19, 1934	May 20, 1935	6
34-8106	" ♂	May 16, 1934	May 6, 1935		14
H73131	" ♀	June 13, 1934	May 13, 1935	June 5, 1936	28
H73153	" ♀	July 18, 1934	July 10, 1936		3
34-8139	Im. ♀	July 25, 1934	May 10, 1935		3
34-8142	" ♂	July 26, 1934	May 6, 1935	May 4, 1936	50
34-8147	" ♂	August 5, 1934	April 29, 1935	April 27, 1936	99
34-8148	" ♂	August 5, 1934	May 1, 1935		13
34-8151	" ♂	August 6, 1934	April 29, 1935	May 5, 1936	9
34-8162	" ♀	August 14, 1934	May 17, 1935		2
34-8169	" ♀	August 16, 1934	July 9, 1935	May 15, 1936	37
34-8180	Ad. ♀	August 21, 1934	July 1, 1936		5
34-8199	" ♂	August 31, 1934	July 28, 1935	July 4, 1936	2
34-8200	Im. ♀	August 31, 1934	September 11, 1935		..
34-8204	♀	September 9, 1934	June 10, 1935	June 11, 1936	12
34-8205	Ad. ♂	September 9, 1934	September 25, 1935		..
34-8213	" ♀	September 19, 1934	May 28, 1935		..
34-8226	Ad. ♂	September 25, 1934	July 12, 1935		1
34-87190	Yg. ♂	May 17, 1935	May 14, 1936		41
34-87194	Ad. ♂	May 17, 1935	May 14, 1936		40
34-87205	" ♂	May 18, 1935	May 6, 1936		20
34-87209	" ♂	May 20, 1935	May 26, 1936		6
34-87213	" ♂	May 23, 1935	May 5, 1936		19
34-87235	" ♂	July 3, 1935	April 30, 1936		17
35-7805	" ♀	July 28, 1935	May 5, 1936		15
35-7839	Im. ♂	August 21, 1935	May 4, 1936		31
35-7855	♀	August 26, 1935	June 11, 1936		18

Excepting a small percentage taken in water-drip traps, all captures of Indigo Buntings (*Passerina cyanea*) have been made with millet seed as bait. Potter type, modified Government sparrow, and top-opening funnel traps have been about equally successful. In 1934, they were attracted to the banding station in numbers when the millet seed ripened in a little patch that was planted as a lure, resulting in a considerable increase in banded birds for that year. None has been planted since then, but quantities are kept at the traps continually in various parts of the garden.—AMELIA R. LASKEY, Nashville, Tennessee.

A Pair of Northern Crested Flycatchers (*Myiarchus crinitusboreus*) **Mated for Three Consecutive Years.** The following nesting records were made at my banding station in Norristown, Pennsylvania:

A147214	—Adult banded	June 30, 1929
	Return-1	June 22, 1933
	" -2	July 8, 1934
	" -3	June 23, 1935
	" -4	June 27, 1936
34-105309	—Adult banded	July 8, 1934
	Return-1	June 23, 1935
	" -2	June 27, 1936

This pair of birds was taken on each of the years 1934, 1935 and 1936 in the nesting box while feeding half-grown young on the dates above given, being mated together for three consecutive years. A147214 is now at least 8 years old.

This pair of birds was taken as returns-1 and return-2 in 1935 and 1936 in nest boxes, feeding half-grown young. A147214 is at least eight years old.—RAYMOND J. MIDDLETON, Norristown, Pennsylvania.

An Experience with a Homing Pigeon.—A homing pigeon was released in Hagerstown, Maryland, to fly one hundred forty-seven miles northeastward to Allentown, Pennsylvania. Confused by a fog, it happened to come to my yard and was caught in a four-celled automotic bird-trap. I released the bird at once, but it remained in the yard and soon reëntered the trap. The bird was given cracked corn, other seeds, water, and rest, and released. The next day it was tossed up about two hundred feet from the yard, but it at once returned and rested all day in a peach tree. I was not able to discover where it stayed each night, but a flashlight showed that it was not in my yard or the adjoining ones. Each morning it was waiting in the trap. The next day I carried it in a paper bag in an automobile across the Susquehanna River and released it five miles from our home. After resting a few minutes in a tree in the woods, it returned at once to our yard. The following day I carried it through two cities and threw it into the air behind an enormous pile of blast-furnace slag, ten miles east of our home, but without any circling to obtain the direction, it flew immediately over the slag, and two hours later I found it in the trap. The next day it was seen in our yard at 8 o'clock, and it was reported later in Allentown, eighty-two miles distant, at 5 P. M. It was always caught in the same trap and in the same quarter of it. All my efforts were directed to get it away from my yard and to get it going and keep it from getting acquainted with the neighborhood. I flew it each time on a full stomach, never when hungry. It left when ready. How was the bird able to return to my yard? Perhaps the expressions "homing instinct" and "homers" are not entirely correct.—HAROLD B. WOOD, Harrisburg, Pennsylvania.

Winter Banding at Concord, New Hampshire.—The winter of 1935–1936 was a poor one at my station, not many birds coming and those seeming trap-shy to an unusual degree. Returns of Tree Sparrows were as follows: B79727, banded February 24, 1929, recaptured February 4, 1936; B78670 banded January 14, 1933, recaptured February 14, 1936; 34-121707, banded January 25, 1935, recaptured February 14, 1936. One repeater spanned the season from January 12th to March 21st; but, as usual, a change in the visitors occurred in February, the break this year coming the 21st. Chickadees afforded one return, 34-121704, banded November 28, 1934, recaptured November 14, 1935; this species was trapped in two distinct groups, the first six from November 14 to December 3, 1935, and the second six from February 13, 1936, to February 16th. Two out of the first group repeated during the later dates, and it was these probably that were occasionally seen between times. Brown Creepers afforded two returns, L7561, banded November 27, 1933, recaptured February 13, 1936, and L70498, banded November 25, 1934, recaptured February 6, 1936. Other birds trapped were Hairy Woodpeckers, Downy Woodpeckers, a White-breasted Nuthatch, and a Golden-crowned Kinglet. Tree Sparrow F101213, which was banded here December 19, 1933, and returned January 31 and February 18, 1935, was found dead at Derby, Connecticut, March 1, 1935. —FRANCIS B. WHITE, Concord, New Hampshire.

Maryland Yellow-throat Age Record.—At my home banding station in Nashville, there have been several returns of the Maryland Yellow-throat (*Geothlypis t. trichas*).[1] Of the 137 individuals banded in the past four years, eleven were retaken in subsequent years—nine of them as returns-1, one as a

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[1]Fall specimens of the Yellowthroat are racially difficult to determine. I am using the above trinomial realizing that I may be in error.

return-2, and one as a return-3 and one a return-4. The details follow:—Numbers F91292, 34-8186, 34-87288, and 35-7833 were returns-1 the year after banding. No. H38889, adult female banded August 23, 1933, was not retaken until June 7, 1936, when at least four years old. No. H38832, adult male banded July 18, 1933, was not recaptured until July 31, 1935, his age then being at least three years. He was recovering from an injury to one side of his head; the wound was healing, but he had lost an eye. 35-7701, an immature male, banded September 21, 1935, was a return-1 on August 31, 1936; 35-7816, a female, banded August 3, 1935, was a return-1 September 8, 1936; and 35-7879, a female, banded September 12, 1935, was a return-1 on September 7, 1936. No. 34-8167, a young male banded August 15, 1934, was retaken July 28, 1935, and May 25, 1936. No. H17839, banded as an immature male September 9, 1932, was a return-3 on September 13, 1935, when three years old, and a return-4 September 19, 1936, now four years old.—AMELIA R. LASKEY, Nashville, Tennessee.

RECENT LITERATURE

(Reviews by Margaret M. Nice and Thomas T. McCabe)

The articles have been selected and arranged under subjects of importance to students of the living bird, and also for the purpose of suggesting problems, or aspects of problems, to those banders who wish to make the most of their unique opportunities.

Headings in quotation marks are the exact titles of articles or literal translations of such titles. Except in the case of books, which are always reviewed under their titles, headings not in quotation marks refer to general subjects, or are abbreviated from titles in foreign languages. References to periodicals are given in italics. Reviews by Mr. McCabe are signed with his initials.

BANDING AND MIGRATION

Banding in Switzerland.[1]—This excellently-arranged report, giving a maximum of information in a minimum of space—age, sex, and distance and direction from place of banding, besides place and date of banding—shows much zeal on the part of Swiss banders. During 1934 and 1935, 49,460 birds were marked, of which 22,381 were nestlings. Birds ringed in the largest numbers were 9,109 Great Tits (*Parus major*), 7,714 Starlings (*Sturnus vulgaris*), and 3,546 Swallows (*Hirundo rustica*). Interesting age records are 9 years for a Common Buzzard (*Buteo b. buteo*), 8 years for a Great Tit, and 6 years for a Blue Tit (*Parus cæruleus*), while Mute Swans (*Cygnus olor*) have been recorded for 6 years on the same lake. As to Alpine Swifts (*Apus m. melba*), 5 birds banded in the nest in 1925 were breeding in the same locality 10 years later, and the same was true of a bird banded as an adult. Most records of the House Sparrow (*Passer domesticus*) show permanent residency, but an adult female banded June 20, 1934, was taken 125 kilometers southeast on October 29th. Data on many species show return of young to the birthplace.

Results from Ringing Titmice.[2]—The Great Tit is predominantly a permanent resident in Switzerland, yet there appears to be a regular migration of a few of the breeding birds, both old and young, to the Maritime Alps. Some of the birds present in winter have later been taken in Upper Austria.

"Results from Ringing the Kestrel (*Falco t. tinnunculus*) **in Switzerland."**[3]—This species is both resident and migratory, often wintering in France. A female, banded as an adult in Switzerland, February 3, 1932, was killed April 10, 1935 in Sweden, 1,500 kilometers to the northeast. The oldest bird was 7 years old, but one in Germany reached an age of 9½ years.

"Old and New from the Ringing of Swifts."[4]—Adults of *Apus a. apus* return faithfully to their nesting sites and usually to the same boxes, pairs often nesting together for many years, although sometimes changing mates. The young birds, however, do not regularly return to the birthplace. The greatest ages reached have been 8 to 10 years.

Banding in Sweden[5].—During 1935, 9,094 birds of 109 species were banded under the auspices of the Göteborg Museum of Natural History. This brings the total to 71,365 individuals, the percentage of recoveries being 3.6.

"Returns of Storks (*Ciconia c. ciconia* (L)) banded in the Netherlands."[6] In 1843, three young Storks were marked with copper plates hung from the neck; one of these was killed in France. From 1929 to 1935, 1,200 were ringed and 97 recoveries made—8 per cent. These Storks spread fanwise over Europe, and the theory of two sharply divided migration routes of the western and middle-European Storks does not hold for Holland. One bird was taken in West Africa.

"Stork Migration and the Mediterranean".[7]—Storks avoid crossing the Mediterranean because they must seek a route with the best wind conditions and food possibilities.

Migration Studies in Finland.—By means of a "new apparatus for registering the variations of migration restlessness in caged migratory birds"[8] it was found in autumn that every drop in temperature stimulated restlessness in a captive Song Thrush *Turdus p. philomelos*;[9] and also that migrating waves of Song Thrushes and Redwings (*Turdus musicus*) closely agreed with the restlessness of a caged Song Thrush hung by an open window both as to dates and hours, the size of the waves being estimated by number of calls heard per ten minutes; there were five waves in October, the first four coinciding with falling barometric pressure, the last with rising, but at this time there was a marked fall in temperature.[10]

"Recent Progress in the Study of Bird Migration."—1936 *Ibis*, 6, (3): 472–630. Few more helpful services could be rendered than Dr. A. Landsborough Thomson's critical summary of this material, with its bibliography of 209 titles. Actually, the paper takes up the subject of migration where Thomson left it in 1926, though he points out that this date saw the publication of the last three comprehensive treatments, those of Wachs, Wetmore, and Thomson. The most important publication since that date, Schüz and Weigold's portfolio, deals only with palæarctic records. Most of the new material on actual migratory movement is drawn from Old World papers, for which we may adduce a number of reasons. European and Asiatic lines of movement, for one thing, lie over thickly and anciently populated lands, and the winter ranges, even in the wilds of Africa, are much better known. Many times more work has been done in Africa and southern Asia than in Central and South America. Furthermore, the primary field study of migration, which flowered and withered in America with the work of W. W. Cooke, is both an ancient and a vigorous tradition in England and on the Continent. Perhaps one reason is to be found in the fact that so much of this kind of ornithological curiosity and energy in our hemisphere is absorbed into the great national banding scheme, whose results are being buried deeper and deeper in the files at Washington, in spite of the example of Schüz and Weigold.

Out of such a reservoir of detail it is hardly possible to select the most important for second-hand reviewing. The author is kept busy holding the balance between theorists of rather single-eyed zeal, and has little chance to reveal his own philosophical reactions to the mass of new thought and new material. He feels that our ignorance of the essential requirements of bird-life is too great for significant speculation on the advantages of migration. As to its origins, the discussions of Mayr and Meise (1930) are rather sympathetically quoted in favor of a theory of post-glacial range-expansion and the necessity of historical explanation of a phenomenon which does not reflect modern geographic conditions. This does not

involve belief in a pleistocene concentration of bird-life in the tropics, but rather in a glacial eradication of northern bird-life, leaving no population with an hereditary urge to seek again their preglacial home. Thomson feels that Rowan has at least established some two-way connection between the gonads, migratory behavior, and environmental conditions. He feels that weather demonstrably affects precise dates of movement, but has little to do with the hypothetical "primary stimulus." He goes so far as to toy with the idea of an "inherent rhythm", or at least one very distantly and complexly related to "all the external conditions governing a bird's life."

There is one elementary question the present reviewer still finds unanswered—the first question every bird-bander is asked by every casual acquaintance, but which, in spite of its profound importance in the study of geographic distribution and variation, has never been seriously attacked namely, What proportion of a breeding population returns to about the same place to breed in succeeding years? Individual stations get their 10 per cent to 15 per cent returns of certain forms, but no area of, say, five or ten mile radius has been so covered as to produce an answer of higher significance. In the present paper Schenk is shown to have achieved something by indirect attack through a statistical analysis of records from all sources of recoveries in breeding season of birds banded in a previous breeding season. He finds 80 per cent within six miles of the original station, 10 per cent from 6 to 31 miles, 3½ per cent from 31 to 62 miles, and the remaining 6½ per cent at greater distances. These figures do not go very far toward answering the simple question just posed, for there are so rarely other stations within short distances in similar environments that the chances of returns at the home station are far greater than in the surrounding zones. The negative evidence is best. We at least know that of all such birds 6½ per cent breed over 62 miles away, etc., etc.—T. T. McC.

[1]Schifferli, A. 1936. 11. und 12. Bericht der Schweiz. Vogelwarte Sempach (1934 und 1935). *Der Ornithologische Beobachter*, 33:113–142.

[2]Schifferli, A. 1935. Nochmals "Ergebnisse der Schweiz. Meisenberingung." *Der Ornithologische Beobachter*, 32:57–63.

[3]Schifferli, A. 1935. Ringergebnisse des Turmfalken (*Falco t. tinnunculus*) in der Schweiz. *Der Ornithologische Beobachter*, 33;26–31.

[4]Schifferli, A. 1936. Altes und Neues aus der Mauersegler-Beringung. *Der Ornithologische Beobachter*, 33:82–85.

[5]Jägerskiöld, L. A. 1936. Göteborgs Naturhistoriska Museums ringmärkningar av flyttfaglar under 1935. *Göteborgs Musei Arstryck* 1936:104–122.

[6]Haverschmidt, Fr. 1936. Terugmeldingen van in Nederland geringde Ooievaars (*Ciconia c. ciconia* (L.)). *Ardea*, 25:112–127.

[7]Geyr von Schweppenburg, H. 1936. Storchzug und Mittelmeer. *Journal für Ornithologie*, 84:339–351.

[8]Siivonen, L. 1936. Ein neuer Apparat zur Registrierung der Intensitätsvariation der Zugunruhe bei gekäfigten Zugvögeln. *Ornis Fennica*, 13:67–69.

[9]Siivonen, L. and P. Palmgren. 1936. Uber die Einwirkung der Temperatursenkung auf die Zugstimmung bei einer gekäfigten Singdrossel (*Turdus ph. philomelos* Brehm). *Ornis Fennica*, 13:64–67.

[10]Siivonen, L. 1936. Die Stärkevariation des nächtlichen Zuges bei *Turdus ph. philomelos* Brehm und *T. musicus* L., auf Grund der Zuglaute geschätzt und mit der Zugunruhe einer gekäfigten Singdrossel verglichen. *Ornis Fennica*, 13:59–63.

LONGEVITY

For how many Years will Birds Lay Eggs?—Perhaps even more surprising than the long life of the Herring Gull (*Larus argentatus smithsonianus*) that lived for 45 years in confinement[11], is the record of his mate as given to Dr. T. G. Pearson by the owner of the birds, Dr. Ben Royal of Morehead City, North Carolina. "Kaiser's mate laid eggs every year from 1893 until and including 1934"; during the last two years she has built a nest but has not laid. This bird laid for 42 years. Three Canada Geese (*Branta c. canadensis*) laid annually until their death at 29, 29, and 33 years of age[12]. The most remarkable case was that of a pair of Eagle Owls (*Bubo b. bubo*) owned by Mr. Meade-Waldo in England; in 1889 when the male was 53 years old and the female 68, they had "bred regularly since 1864, namely 32 years, having in that time raised no less than 93 young ones. They are still in the best of health".[13] One would like to know the previous and subsequent history of this "marvelous old pair."

Cardinal of Thirteen Years.[14]—The famous *Richmondena c. cardinalis* in Tennessee and his mate started a nest on March 28, 1936, but both this and the following nest came to grief.

For other records of longevity see Nos. 1, 3, and 4.

"The Question of Sexual Maturity in Small Birds."[15]—Some tropical birds lay eggs at very early ages; some *Ploceidæ* at eight weeks, the Shell Parakeet (*Melopsittacus undulatus*) and a Zebra Finch (*Tæniopygia castanotis*) at three and four months, and *Amadina erythrocephala* at two months. Both sexes in the *Turnicidæ* (Button-Quail) reach sexual maturity before they are four months old. In some cases climate may make a difference: in Hungary, Starlings (*Sturnus vulgaris*) regularly breed at one year of age, but in Latvia very few do so. As to Black-headed Gulls (*Larus ridibundus*), first-year birds seldom breed in Silesia and never in East Prussia, but often in Holland, Switzerland, and Hungary. Instances are given of very young birds carrying nesting-material and feeding still younger birds.

[11]Pearson, T. G. 1935. *Bird-Lore*, 37:412–413. Reviewed in *Bird-Banding*, April, 1936.
[12]Flower, S. S. 1925. Contributions to our Knowledge of the Duration of Life in Vertebrate Animals. IV. Birds. *Proc. Zoöl. Soc.*, Part 4:1365–1422.
[13]Gurney, J. H. 1899. On the Comparative Ages to which Birds Live. *Ibis*, Ser. 7, 5:19–42.
[14]Ganier, A. F. 1936. Notes from the Nashville Area. *The Migrant*, 7:47.
[15]Steinbacher, J. 1936. Zur Frage der Geschlechtsreife von Kleinvögeln. *Beiträge zur Fortpflanzungsbiologie der Vögel*, 12:139–144.

LIFE-HISTORY

"Studies on the Bank Swallow, *Riparia riparia riparia* (Linnaeus) in the Oneida Lake Region."—D. Stoner, 1936. Roosevelt Wild Life Annals, 4, No. 2: 121–234. Valuable data are given on weight of both adults and young, besides a great deal of material on body temperature. The temperature of adults ranged between 103.5° and 110° F., averaging 107.1°. As to the young, birds from 1 to 4 days old averaged 99.89°; from 5 to 9 days, 102.51°; from 10 to 15, 104.56°; and when able to fly, 106.24°. Both sexes excavate the burrow, build the nest, incubate, and brood the young. Eggs hatched in 14 to 16 days, young were fledged in 18 to 22 days. Soon after leaving the nest the young "engage in excavating activities. . . . But the cavities are seldom more than a few inches deep, and are used by the birds as resting places." The young are heavily infested with Protocalliphora. For banding purposes the adults were captured by "directing, by means of a small hand mirror, a beam of light into the burrow"; this caused such uneasiness to the bird that it usually emerged. Of 266 adults banded, 8 were recovered the following year, and of 919 young only two returned. Five adults were found in the colony in which they had been banded, the others from two to three miles away. One young bird was taken near its birthplace, the other two and a half miles away. Although there were doubtless other banded birds that were not captured, since only five days were spent in the field the second season, yet it is evident that in this species only a small proportion of adults return to their former breeding localities. There is no summary and no index.

"Roosting Habits of the Tree Creeper."—P. S. Kennedy. 1936. *British Birds*, 30:2–13. *Certhia familiaris britannica* excavates cavities for itself in the soft bark of sequoias that have been introduced into England. The birds go to roost *after* sunset in winter, but in March *at* sunset; they leave a few minutes before sunrise.

"The Composer."—F. M. Chapman. 1936. *Bird-Lore*, 38:267–273. Description of the remarkable powers of song of a Black-billed Wren (*Pheugopedius fasciato-ventris albigularis*) at Barro Colorado.

"The St. Kilda Wren."—1936. *Scottish Naturalist*, No. 217:9–21. Messrs T. E. Harrison and J. N. S. Buchan add this important collection of concentrated detail to their paper on territory and food habits of the same bird. (*Journ. Anim. Ecol.* 3:133–145; reviewed in *Bird Banding*, 6, April, 1935; 73.) There is little or no discussion of implications, but the paper is a model of modern methods of

organized observation, with certain oversights, such as the irritating difficulty or impossibility of finding the dates of most of the observations, especially heinous in such tables as that of feeding rate. Convincing amounts of material are analyzed on rate of feeding young and removal of fæces, nest-material (including the "cock nests", which are sometimes used), the character of song as compared to the mainland bird, fluctuations of song-volume during July and August, and its daily periodicity, "curse notes", rate and distance of flight, the presence of dimorphism. —T. T. McC.

The Home Life of the Chiffchaff.[16]—*Phylloscopus collybita* is a territorial bird, the male spending most of his time singing high in the trees, while his mate builds the nest on or near the gound, incubates, broods, and feeds the young. The male helped feed the young at only one nest out of seven; in this case the nest was 40 centimeters above the ground and could be easily reached by the "ground-shy" male through cover. Incubation lasts 15 to 16 days; the young leave at 13 to 14 days. On a cold, rainy morning a female left her eggs 7 times during 1¾ hours; periods on the nest ranged from 5 to 19 minutes, averaging 11 minutes; periods off the nest ranged from 1 to 8 minutes, averaging 5.5 minutes. While the female has to brood the young, she feeds them every 10 to 15 minutes, but later every 4 to 5 minutes or oftener.

"Recoveries of German Red-backed Shrikes (*Lanius c. collurio* **L.)".**[17]—Adult males return faithfully to their nesting territories, sometimes to the very same bush, and some females do likewise. Some birds have had the same mates two years in succession. One breeding female banded July 27, 1933, was found 125 kilometers northwest at the end of July, 1935. Twenty young have returned to breed where hatched, while three have been found from 60 to 68 kilometers distant. A male banded with a red ring nested 1 kilometer from his birthplace; he had a different mate each year for four years. The first year he arrived 14 days later than the earliest of his species, but afterwards only 4 to 6 days later. This species in Silesia is a favored host of the Cuckoo (*Cuculus canorus*), but some Shrikes remove the foreign egg.

"*Lanius collurio* **L. and** *Lanius senator* **L. A Contribution to the Biology of Two Species of Shrikes."**[18]—Along the Lower Rhine the Red-backed Shrike is abundant, the Woodchat Shrike rare; neither seem to be parasitized by the Cuckoo. The territories of the former bird are always associated with hawthorns and are some two hundred by three hundred meters in size. The matter of impaling is discussed at length and many illustrations are given.

"Behaviour of Starlings at Nesting Site."—George Marples. 1936. *British Birds*, 30:14–21. An interesting study of the nesting life of *Sturnus v. vulgaris*, the male being a banded bird. He appropriated the box in late January, being joined by a mate a month later; on April 2d strange courtship behavior was noted in which the female pursued the male, the author calling it "branch-chasing." "The male lived somewhat in dread of his mate for, quite commonly, when she was inside the box he would fear to enter, sitting on the perch waiting until she came out." Both birds took part in nest-building, the male bringing green leaves and flowers as well as plant stems. Both birds incubated and fed the young, although the female at first drove her mate away when he came with food.

"Observations on the Spot-backed Weaver, (*Ploceus spilonotus* **Vig.)."**—R. B. Cowles. 1936. *The Auk*, 53:295–297. In South Africa flocks of these birds eat grains in fields and around pig-pens, and then "dash over to visit" some "nectar bearing flowering tree." As many as twenty-five nests were started in one large Acacia. "When the nest is partly completed the male hangs to the lower edge of the opening and with fluttering wings and loud calls moves or shakes the nest, rotating it from side to side violently, meanwhile looking alertly in all directions. Within a minute or two a female will fly up to the nest, give it a thorough inspection and depart again, for they take no part in the construction work, at least until after all the externals have been completed."

"Notes on the Field Sparrow in Michigan."—L. H. Walkinshaw. 1936. *Wilson Bulletin*, 48:94–101. Data on 70 nests: size of sets ranged from 2 to 5 eggs, most nests containing 3 and 4 eggs; in 20 out of 46 nests young were fledged, giving 43.5 per cent success. Incubation is stated to have taken only 10 days in two cases, but as in each instance one egg failed to hatch, and as the eggs were not marked as laid, this conclusion is unwarranted. The young sometimes left the nest when only *six* days old if disturbed. When newly hatched they weighed 1.1 grams, and when ready to leave they averaged 10.5 grams. The females did practically all the feeding, an observation which agrees with that of Lynds Jones, 1913, *Wilson Bulletin*, 25:67–71. Very little seems to have been published on the life-history of *Spizella pusilla*.

"The Breeding Biology of the Little Ringed Plover (*Charadrius dubius curonicus*)."[19] Both sexes share incubation, and care of the young; second broods are raised near Berlin.

"On the Fighting of Blackcock."—George K. Yeates. 1936. *British Birds*, 30:34–37. Descriptions and photographs of *Lyrurus tetrix britannicus* on a lek near a keeper's cottage in northern Scotland. "The birds may only be relied upon to fight either when they first arrive (when all the birds seem momentarily to indulge in a short joust before settling down to feeding), or on the arrival of a grey hen in their midst." "When at last they do come to grips, it is a mere mockery of a fight."

"Observations at the Nest of a Hen-Harrier (*Circus c. cyaneus* **L.)."**[20]—Females are usually ready to attack human intruders near the nest, while males are often more cautious, but the reverse was true at one nest which was watched from a blind. The male provided the food for the family for the first three or four weeks. In quiet weather more mice were captured; in windy weather more birds; while in rainy weather very little of anything was caught. The young flew at the age of 32 to 34 days; they remained in the nesting territory two or three weeks longer and were fed by the parents. When the latter came in sight, the young flew to meet them, the parents flew higher and dropped the prey, which was caught in midair by the young birds.

For other life-history studies see Bird Behavior.

[16]Prenn, F. 1936. Beobachtungen zur Lebensweise des Weidenlaubsängers (*Phylloscopus collybita* Vieill). *Journal für Ornithologie*, 84:378–386.

[17]Ecke, H. 1936. Die Ringfunde deutscher Rotrückenwürger (*Lanius c. collurio* L.). *Der Vogelzug*, 7:123–135.

[18]Schreurs, T. 1936. *Lanius collurio* L. und *Lanius senator* L. Ein Beitrag zur Biologie zweier Würgerarten. *Journal fur Ornithologie*, 84:442–470.

[19]Krösche, O. 1936. Zur Brutbiologie des Flussregenpfeifers (*Charadrius dubius curonicus*). *Beiträge zur Fortpflanzungsbiologie der Vögel*, 12:145–149.

[20]Hennings, H. 1936. Beobachtungen am Horst der Kornweihe (*Circus c. cyaneus* L.). *Beiträge zur Fortpflanzungsbiologie der Vögel*, 12:105–113; 150–160.

TERRITORY

An early statement of the territorial concept was given by William Brewster, 1906, "The Birds of the Cambridge Region of Massachusetts," *Mem. Nuttall Ornith. Club*, No. IV, on pp. 62–63, as pointed out to me by Charles C. Adams, who quoted it in his article, "The Ecological Succession of Birds," 1908, *The Auk*, 25:109–153. Mr. Brewster says in part: "In my opinion the desire for exclusive possession so conspicuously shown by the male, and often by him alone, is usually the direct result of *sexual jealousy*. . . . If his concern were chiefly in respect to the food supply, it would be equally manifested at every season and towards all birds who subsist on the same food that he and his mate require—which is certainly not the case."

"Further Notes on Territory in the Great Crested Grebe."—L. S. V. Venables and D. Lack. 1936. *British Birds*, 30:60–69. From five years' observations on *Podiceps c. cristatus* the authors conclude: "Aggressive behaviour resulting in a 'territory' is exhibited by only a few individuals, the majority tolerating other individuals close to a nest. . . . The territory is not of primary significance in

pairing up, as many pairs are formed before they acquire a territory; but a male does at times acquire and defend a territory before obtaining a mate. The territory does not usually include the feeding ground of the pair, and is in all cases deserted when the young hatch. . . . The territory is associated with the neighbourhood of the actual or future nesting platforms, but does not seem of benefit to the species in this connection. The territory seems to be an individual affair, of no fundamental significance to the species."

BIRD BEHAVIOR

"Continuity of Behavior in the Nuttall White-crowned Sparrow."—Barbara D. Blanchard. 1936. *Condor*, 38:145–150. *Zonotrichia leucophrys nuttalli* is a permanent resident on the campus of the University of California. "Each pair remained on its breeding area throughout fall and winter. Mates foraged and perched together and followed each other about." The "second mate of a polygamous male remained with him through the winter and bred with him again, disregarding a young male . . . with adjacent territory." These two females were jealous of each other; each "created for herself a sub-division of the main territory which she defended *against the other female* by loud singing and fighting, and in which she finally chose her nest-site. . . . Had they not been banded, I should have thought I was watching a boundary dispute between two males."

This fine study on problems of territory and relations between the sexes is based on intensive observation on a common bird marked with colored bands. The course of events compares well with that in the Song Sparrow except for the marked personal attachment between the mates throughout the year and the astonishing singing of the females.

"Courtship and Sexual Selection of the Flicker (*Colaptes auratus luteus*)."—G. K. Noble. 1936. *The Auk*, 53:269–282. A notable example of experimental technique with wild birds. The sexes in this species are alike in appearance except that the male has a black moustache. Mounted birds of both sexes were placed in the nesting tree of a pair, and the female attacked the female mount and the male the male mount. The female was caught and provided with an artificial moustache, with the result that she was relentlessly pursued by her mate. The display—the "we-cup call, the head bobbing with uptilted bill, the wing and tail flitting"—is not a means of courting the opposite sex, but "means that Flickers of both sexes employ to intimidate rivals. The extreme display is a wide-spreading of the tail and a tilting at an angle of 45 degrees or more exposing its bright yellow under surfaces to the rival." "When a female has driven off her rivals she may induce the male to mate by giving a nasal call heard on no other occasion." "After the young have left the nest the male may still defend the nesting hole but he treats both sexes of mounted birds the same way." The author concludes that "The bright yellow colors of the concealed sufaces of Flickers have not evolved through Darwinian sexual selection, that is through female choice, nor through mutual selection as defined by Huxley. Their chief function is to intimidate and hence natural selection alone is adequate to account for their genesis."

There are only two minor criticisms that occur to the reviewer, both in the realm of theory. Dr. Noble says "mature Flickers apparently have learned to recognize the moustache as a badge of maleness." How could first-year birds react in any adequate way before they "learned" the significance of this badge? Is it not more reasonable to expect it to be known instinctively? And why is not the author content at present with disproving sexual selection? Many scientists believe that natural selection is equally hypothetical.

Nesting Study of the Hobby.[21]—An important paper based on 338 hours of observation at four nests of *Falco s. subbuteo* in Holland. There is space to mention only a few points. The division of labor between the parents depends on the nature of the prey: when this consists of insects both parents hunt, but when it consists of birds and mammals the male is the provider, the female doing no

hunting as long as the young need brooding. The hunting territory is not defended, only the vicinity of the nest. One pair adopted a young bird a few days older than their own young, although the latter recognized it as a stranger. The young begged from an adult regardless of whether or not it carried prey; they begged from strange Hobbies flying over and also Kestrels (*Falco tinnunculus*), but not from Sparrow Hawks (*Accipiter nisus*) nor Ring Doves (*Columba p. palumbus*). Adults recognized individuals of their species either as mates or strangers at a distance of five hundred meters. A splendid study of bird behavior.

"An Attempt at an Ethogram of the European Avocet (*Recurvirostra avosetta* L.), with Ethological and Psychological Remarks."—G. F. Makkink. 1936. *Ardea*, 25:1–62. A careful study pursued under difficulties because of the impossibility of distinguishing the sexes and also because no individuals were marked. Social, sexual, and parental conduct is described in detail and illustrated by sketches. Avocets are gregarious throughout the year, yet one of their chief activities in the nesting season appears to be fighting. "They seek conflicts out of a sexual combativeness and not because they want to fight for the possession of a territory. While these fights last the two mates take the same side, and each of them attacks the other birds." "In case of floods Avocets manage to make their nests sufficiently high to raise their eggs clear out of water, as other marsh- or shore-birds do." "About the time when the eggs hatch, the Avocet gets a second alarm-call, by means of which practically only gulls are signalized and pursued. For man, mammals and other birds apart from gulls the ordinary alarm-call is sounded. . . . The 'gull-cry' has been taken to be a part of the hereditary equipment, which enables the Avocet to announce its chief natural enemy." Thirty-five titles are given in the bibliography, but the important observations on this species by Edmund Selous in "Realities of Bird Life," 1927, London, Constable, were missed, as well as Miss E. L. Turner's article in *British Birds*, 14:194–202, 1921.

"The Nesting of the Emu." 1936, *Emu*, 35:202–210. Mr. David Fleay's account of the nesting of captive Emus (*Dromaeus novae-hollandiae*) in Melbourne has the makings of a classic. Without taking too much stock in reproductive behavior in captivity, it is doubtful whether a like sequence of psychological metamorphoses was ever recorded of any bird, wild or tame. Perhaps such revolutions of personality always occur, inscrutable beneath the surface of secretive or inexpressive behavior. But in these grotesque creatures nothing is inscrutable and nothing inexpressive; every change of mood and temper is as obvious as in an obstreperous seven-year-old child. The general sequence was about as follows.—

1. A female, "Emma," which has been the butt of a female cage-mate for months, suddenly attacks the latter and practically kills her.
2. Emma woos and wins "George," the handsomer of two remaining cage-mates (males).
3. Emma and George drive away, but do not harm, the remaining male.
4. Emma begins laying fertile eggs all over the paddock, eleven in all, to which neither of the pair pays the least attention.
5. The odd male, in turn, discards his inferiorism and bullies both George and Emma until he has to be removed.
6. Emma starts laying a new clutch, in a proper spot. George pays no attention —is playful and affectionate with his keeper.
7. After fourth egg, George, suddenly interested, moves eggs some distance, becomes hostile to keeper, begins to incubate. Copulation stops.
8. Emma suddenly transformed into a dangerous fury, yet pays no attention to mate or nest or anyone approaching them.
9. The brooding George eats practically nothing for many weeks. Allows Emma to come to the nest to lay eggs up to eight.
10. George, perhaps feeling incapable of further responsibility, attacks Emma when she approaches the nest. She is saved by removal. No more eggs.
11. George deeply agitated by voice of incubator chick of first scattered clutch concealed near by.

12. Hatching time approaches. George viciously hostile to keeper, continually turning eggs and uttering certain sounds. Emma not interested; reintroduced, attacked at once.

13. Eggs hatch in four days, though the last four were laid during thirteen days after incubation had begun. George, worn and emaciated, at once becomes so gentle he can be picked up.

14. George's perfections as a "mother." Emma entirely without interest.—T. T. McC.

"The so-called 'Injury-feigning' in Birds." 1936. *Oologists' Record*, 16:25–37.—The Reverend F. C. R. Jourdain devotes most of these pages to a review, based on the widest reading and broadest experience, of the prevalence of this behavior in the different systematic groups, with the conclusion that, while it is not restricted to ground-nesters as strictly as Julian Huxley thought, yet most of the exceptions, such as those among the pigeons and owls, occur in groups which are still partly, and may have been primitively, ground-nesters. This does not apply to the few examples among the *Passeres*, notably among the true warblers and the thrushes. Scattered exceptions occur among the Minivets, Bulvuls, Wood-warblers, and in a small list of Australian forms recorded by A. H. Chisholm. The cases of human observation of the effect on natural enemies are few, but it has been seen to be efficient against dogs, coyotes, foxes, cats, weasels, and stoats. There is one definite record of a failure, when a Knot, exhibiting such behavior before a dog, came too close and was caught. The reviewer has himself more than once caught female Franklin's Grouse (*Canachites franklini*) in his hands under these circumstances, and cannot imagine their adopting the same behavior before natural enemies without fatal results. The bird may have an even exaggerated idea of human incompetence.

Various theories receive brief criticism. The author does not believe in mere incapacity through excess excitement, for birds have no reason for such excess of fear before many of the enemies involved. The point might, of course, have been made that *incapacitating* fear must have been an insupportable selective handicap. The theory of Dewar and of Friedmann, that the condition is the nervous resultant between the reactions of fear and solicitude, the instincts to protect and escape, he feels to be incompatible with his own impression that the bird is "playing to the gallery," watching the effects of its performance, modifying it according to development.—T. T. McC.

A discussion of "injury-feigning" has been the theme of recent letters to the *Auk*: by H. S. Swarth, July, 1935; F. H. Allen, January, 1936; and A. H. Chisholm April, 1936; none of these authors agrees with Friedmann's theories. It seems to the reviewer that "injury-feigning" is an instinctive behavior-pattern on the same order, for instance, as the intimidation display of the Flicker described by Noble. When an incubating or brooding bird of certain species is confronted by danger to its nest or young, it sometimes *displays in such a way as to draw attention to itself* and away from its nest or young. There is no simulation of injury in the display shown by Song Sparrows and many Wood Warblers when nearly grown young are in danger: the parents rush about near by with wings held stiffly aloft—an attitude assumed on no other occasion, at least by *Melospiza melodia*. Instead of "injury-feigning" would not a better term be that used by R. C. Murphy[22] in regard to the Woodcock—"nest-protecting display?"

[21]Schuyl, G., L. Tinbergen und N. Tinbergen. 1936. Ethologische Beobachtungen am Baumfalken (*Falco s. subbuteo* L.). *Journal für Ornotholonie*, 84:387–433.

[22]Nest-Protecting Display of the Woodcock. 1926. *Bird-Lore*, 28:265–266.

ECOLOGY

"The Northern Bob-white's Winter Territory."—P. L. Errington and F. N. Hamerstrom, Jr. 1936. Agri. Exp. St. Iowa State Coll. Agri. Ames, Iowa. Research Bulletin 201:302–443. An enormous amount of patient, well-planned work is represented in this study on *Colinus v. virginianus*; it will prove valuable

not only to conservationists and wild-life managers, but also to students of biological problems. "Winter in the northern part of the bob-white's range seems to be the one supremely critical period in the life equation of the species, and winter survival cannot exceed ability of environment to accommodate population." The authors found that "a given tract of environment is capable of accommodating a rather definitely limited population even under optimum weather conditions." Losses from predation of secure populations have been light, some 6 per cent per 90 days, but "over-populations" were reduced either through departure of the excess birds or through predation. Comparative abundance of "buffer" populations appeared to make little difference in the intensity of predation upon Bob-whites. "The limited data at hand point to considerably higher rates of increase for breeding populations which have been drastically reduced previously by emergencies, over-shooting, etc., provided that the surviving birds are well situated in strong environment." "Intensive campaigning against native predators is not advised, . . . predator control is no substitute for food and cover, and practically all control efforts that we have witnessed in the North have been futile from the standpoint of bob-white management, if not actually detrimental." An index would have helped in making available the large body of information.

"Territory and Distributional Variation in Woodland Birds." 1936. *Scottish Naturalist*, No. 218: 35–45. Mr. V. D. van Someren tries to get too much from fourteen censuses of a five-acre deciduous wood in Midlothian, from January to April inclusive, though the work was well-planned, and the suggestions stimulating. He sees and emphasizes an interesting constancy in the number of species underlying great variability in the number of individuals, which is a good start for the study of the actual requirements of those species. This is followed by an attempt to synchronize abundance or scarcity in like groups, as in three kinds of Tits, or in the Song-thrush and the Blackbird, rather successfully in the first case. But the naïve suggestion of limited food-supply of each type as the factor limiting the rather constant species number will not carry us very far. Ecology, alas, is seldom so simple. If limited amounts of a given type of food equally desirable to several forms be granted, there still remains no reason for its being consumed by a single species more than by smaller numbers of each of several like-dieted species.

A systematic effort to postulate nest-positions from observed singing-posts produced a fairly positive experimental result in the case of the Song-Thrush only. The correlations of mass movements within the wood, horizontal or vertical, with the wind, are very important.

One wishes the writer might go on to an intensive study, on the same ground, of the requirements of a half-dozen of the species, (admittedly a big job), seeking those general or specific, widespread or localized, which keep the inhabitants *in*, and which therefore might suggest what keep the rest *out*, and perhaps approach the explanation of the species number.—T. T. McC.

"The Rookeries of Edinburgh."—*Scottish Naturalist*, No. 218, 1936:53–56. The British Isles remain amazingly census-minded. A count of Rook nests by the Midlothian Ornithological Club on the fifty-one square miles within the city shows a total of 3060, almost one hundred per cent more than were privately counted in 1921.—T. T. McC.

"The Avifauna of the Inland Waters of Aland."[23]—Censuses of water and marsh population of a large number of lakes with notations of ecological requirements and suggestions for further lines of study.

Bird-Insect Nesting Associations. *Ibis*, VI, 3, July, 1936, 460–471.—R. E. Moreau, of the East African Agricultural Research Station at Amani, has analyzed a surprisingly large amount of literature on this subject in addition to recent observations near Tanga by himself, Mrs. Moreau, and Mr. T. A. Baldock. Records of bird "associations" with living creatures (other than mere prey) are so seldom anything but records of two organisms occupying adjacent space that these facts come as a draft from the blue, with their certainty of a definite linkage, free in

most cases from any predatory factor and often from any self-evident requirement of an identical physical environment. Seemingly, we of the North Temperate must watch developments from the side-lines, as the spectacular instances so far recorded are practically all tropical, from Asia, Africa, Australia, and South America.

Of the three types of association the first "nest building inside insect structures," is, as the author says, the least interesting, amounting to "straightforward nest-parasitism", usually between Trogons, Parrots, Kingfishers, or Cotingids and arboreal ants or arboreal or terrestrial termites. Here at the outset, however we meet the most intriguing fact of all, that even the most aggressive "soldier" forms, intolerant of other intrusion, tolerate both the adult and the helpless young birds. In the case of the Woodpeckers the ant hosts are eaten and of course their structures damaged to some degree. Stuart Baker says that the various Indian Woodpeckers which inhabit ants' nests lay abnormal soft, transparent eggs.

Class two concerns only two parrots (one Australian, one South American) both also members of the first group, in whose nests the insects lay their eggs, which develop larvæ which are "practically commensal with the young birds."

The third class, where the observations of Moreau and his associates belong, deals mostly with Ploceids and Icterids and aculeate wasps. He (like Myers and other writers) believes the situation analagous to cases of small birds which build close to the nests of powerful raptors or about human dwellings. The first-hand observations are mostly of Sunbirds and Spermestine Weavers which nest close to "wasp combs, shaped like dagger-blades, up to seven inches long, which are common in the trees here." In this class mutual toleration is complete, the nests are practically all covered, and it is the bird which seeks the association (which, according to Myers, is a universal law of all bird-insect nest associations). —T. T. McC.

"The Malthusian Principle in Nature."—W. L. McAtee. 1936. *Scientific Monthly*, 42:44–456.—In this suggestive paper the author concludes that "Malthus's postulated geometric increase of population is not the rule in nature; it is merely a potentiality, rarely realized. Populations are usually checked far short of a subsistence limitation. Automatic restriction by lowering of birth rate in response to density and by a great variety of self-limiting phenomena, together with sweeping indiscriminate destruction of immature forms, involving little or no actual competition either among themselves or with adults, seem to be the principal factors involved in maintaining the stability of populations."

[23]Palmgren, P. 1936. Über die Vogelfauna der Binnengewässer Alands. Acta Zoological Fennica, 17. 59 p.

PARASITES

"Biology of the Mallophaga."[24]—Valuable article with a bibliography of 109 titles.

[24]Eichler, W. 1936. Die Biologie der Federlinge. *Journal für Ornithologie*, 84:471–505.

BOOKS

Ethics of Egg-Collecting. Eric Parker. 1935. London. The Field. 120 p.5/. —This book consists almost entirely of letters published in *The Field pro* and *con* on the subject of egg-collecting. Even the oölogists do not claim that their activities have any scientific value, merely asserting that they do no harm. The most pernicious aspect of the whole affair is that whenever a bird's numbers become dangerously low, egg-collectors hasten to prevent it from reproducing. They have already exterminated the White-tailed Eagle and Osprey in Great Britain and are now persecuting the Crested Tit, Dotterel, and other rare species. In this country they are playing a leading rôle, in decimating some of the species most in need of protection, among them Eagles, Duck Hawks, and our beautiful Kites.

Years ago W. H. Hudson proposed as the only remedy that private egg-collections be prohibited by law. Is not this the logical solution?

The American Woodcock *Philohela minor* **(Gmelin).** Olin S. Pettingill, Jr. 1936. Mem. Boston Soc. Nat. Hist. 9 (2): 169–391. Cloth, $4.75; paper covers $3.50.—The author establishes the facts that the male Woodcock has nothing to do with the care of the eggs and young, that his spectacular flight-song is given for the purpose of attracting mates, and that the "carrying" of young by the mother is purely accidental. Interesting detailed accounts are given of the flight-song performance, of the time of beginning (at about two foot-candles of light) some twenty-one minutes after sunset on clear evenings, its duration, the songs of other birds, etc. The Woodcock is a highly specialized species with little power of adaptation. "Its one reaction to all forms of danger is to crouch and remain motionless until danger is passed." Its numbers have been greatly reduced and it needs additional protection, both legal and in the form of sanctuaries.

A long bibliography is provided, but no index. Although the material is valuable, one feels that some of it could have been condensed to advantage, that too much space is devoted to quotations, and that publication in a smaller, less expensive format would have been preferable.

Birds in the Wilderness. Adventures of an Ornithologist. Geo. M. Sutton. 1936. N. Y. MacMillan. $3.50.—Dr. Sutton is an adventurer, traversing the length and breadth of the continent in his search for experiences with new birds. Although this book lacks the unity of his superb "Eskimo Year," yet the chapters are full of interest, particularly those on his childhood experiences and his pet Road-runners, while the "Adventure with a Turkey Vulture" is nothing short of a classic. The book is illustrated with a dozen of the author's inimitable drawings and paintings.

Preparation of Scientific and Technical Papers. Sam. F. Trelease and Emma S. Yule. 1936. 3d Ed. Baltimore. Williams and Wilkins. 125-p. $1.50.—An excellent concise guide dealing both with the fundamentals of organizing a scientific paper and with all sorts of details, ranging from the use of abbreviations to the correcting of proof. While the chief purpose is to aid the student with his first article, it also offers many helpful hints to the experienced writer.

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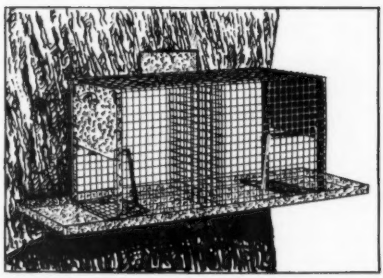

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